Missouri University of Science and Technology

Scholars' Mine

Research Data

01 Jan 2019

# Experimental Investigation of the Dynamics of Trapped Non-Wetting Droplets Subjected to the Seismic Stimulation in Constricted Tubes: Supporting Information

Yandong Zhang

Chao Zeng

Baojun Bai
*Missouri University of Science and Technology*, baib@mst.edu

Wen Deng
*Missouri University of Science and Technology*, wendeng@mst.edu

## Recommended Citation

# Experimental Investigation of the Dynamics of Trapped Non-Wetting Droplets Subjected to the Seismic Stimulation in Constricted Tubes: Supporting Information

## Abstract

- Aspect Ratio of 4.5
- Aspect Ratio of 9.0
- Video Demos

## Keywords and Phrases

Multiphase Flow; Seismic Stimulation; Droplet Oscillation; Permeability Change

## Disciplines

Geophysics and Seismology | Geotechnical Engineering

## Comments

**Experimental investigation of the dynamics of trapped non-wetting droplets subjected to the seismic stimulation in constricted tubes**

Yandong Zhang[1], Chao Zeng[2], Baojun Bai[1] and Wen Deng[2*]

[1] Department of Geosciences and Geological and Petroleum Engineering, Missouri University of Science and Technology, Rolla, Missouri, USA 65409

[2] Department of Civil, Architectural and Environmental Engineering, Missouri University of Science and Technology, Rolla, Missouri, USA 65409

[*] Corresponding author. Tel: +1 573 341 4484. E-mail address: wendeng@mst.edu

**Introduction**

The complete data files contain the original recorded video (.cine format) files, the initial position of the non-wetting droplets photo (.bmp) files and the partially manual-tracked data point (.pps format) files of two aspect ratios and three types of non-wetting droplets under five frequencies (10 Hz, 20 Hz, 30 Hz, 40 Hz, 50 Hz). They are open to the researchers who are interested in our experimental work via MST Scholars' Mine. The original video files (.cine format) can be open in the Phantom Camera Control software, which is free to download via the link: https://www.phantomhighspeed.com/resourcesandsupport/phantomresources/pccsoftware. Further interesting work are encouraged and can be done freely based on the original raw files. The initial position of the non-wetting droplets photo (.bmp) files can be open in simple viewer or ImageJ for further analysis. The manual-tracked data point (.pps format) files can be open in Microsoft Excel software. One can find seven column of data points in each file. 'ImageNr.' indicates the frame number for each video. 'TimeFromTrig.' is the time interval reference from the beginning of each recording process and the unit is second (s). 'Absolute Time' is the accurate 24-hour clock time (CST) and MM/DD/YY log when each frame is taken of each video. 'X0' and 'X1' are the horizontal motion displacements of upstream front meniscus and the marker in feet (ft), respectively. 'Y0' and 'Y1' are the vertical motion displacements of upstream front meniscus and the marker in feet (ft), respectively. During our data analysis, we only considered the horizontal displacements 'X0' and 'X1' while the point we chose can move vertically only in a small degree because the error raised by manual tracking. All data points were partially collected since we only needed several periods of vibration to compare with the theoretical results. More points from any interesting places in the video can be further manual or auto-tracked in the software. The number of data point in each file varies for different frequencies and acceleration amplitudes. Data points of at least three periods of vibration were collected to ensure a good comparison with theoretical

results. We also upload two demo videos for the oscillation and mobilization processes to give a general concept of the vibration process in a constricted tube.


**Supplementary Files Annotations**

Followed are the names of all uploaded data files and their annotations.


**Demos**
1. "Oscillation Demo.mp4" – A short oscillation process demo subjected to seismic stimulation;
2. " Mobilization Demo.mp4" – A short mobilization process demo subjected to seismic stimulation;


**Files at aspect ratio of 4.5**
**Oscillation**
**Hexane (0.3 cP)**
1. "Initial Position-10Hz-2mm-hexane-ratio4.5.bmp" – Initial position photo of the hexane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-hexane-ratio4.5.bmp" – Initial position photo of the hexane droplet subjected to 20 Hz seismic stimulation;
3. "Initial Position-30Hz-2mm-hexane-ratio4.5.bmp" – Initial position photo of the hexane droplet subjected to 30 Hz seismic stimulation;
4. "Initial Position-40Hz-2mm-hexane-ratio4.5.bmp" – Initial position photo of the hexane droplet subjected to 40 Hz seismic stimulation;
5. "Initial Position-50Hz-2mm-hexane-ratio4.5.bmp" – Initial position photo of the hexane droplet subjected to 50 Hz seismic stimulation;
6. "f10Hz-a0.2-2-Hexane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 10 Hz seismic stimulation;
7. "f20Hz-a0.4-2-Hexane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 20 Hz seismic stimulation;
8. "f30Hz-a0.6-2-Hexane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 30 Hz seismic stimulation;
9. "f40Hz-a0.8-2-Hexane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 40 Hz seismic stimulation;
10. "f50Hz-a1.0-2-Hexane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 50 Hz seismic stimulation;
11. "f10Hz-a0.2-2-Hexane-ratio4.5.cine"- Original recorded video file of the hexane droplet subjected to 10 Hz seismic stimulation;
12. "f20Hz-a0.4-2-Hexane-ratio4.5.cine"- Original recorded video file of the hexane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a0.6-2-Hexane-ratio4.5.cine"- Original recorded video file of the hexane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a0.8-2-Hexane-ratio4.5.cine"- Original recorded video file of the hexane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.0-2-Hexane-ratio4.5.cine"- Original recorded video file of the hexane droplet subjected to 50 Hz seismic stimulation;


**Decane (0.92 cP)**
1. "Initial Position-10Hz-2mm-Decane-ratio4.5.bmp" – Initial position photo of the decane droplet subjected to 10 Hz seismic stimulation;

2. "Initial Position-20Hz-2mm-Decane-ratio4.5.bmp" – Initial position photo of the decane droplet subjected to 20 Hz seismic stimulation;

3. "Initial Position-30Hz-2mm-Decane-ratio4.5.bmp" – Initial position photo of the decane droplet subjected to 30 Hz seismic stimulation;

4. "Initial Position-40Hz-2mm-Decane-ratio4.5.bmp" – Initial position photo of the decane droplet subjected to 40 Hz seismic stimulation;

5. "Initial Position-50Hz-2mm-Decane-ratio4.5.bmp" – Initial position photo of the decane droplet subjected to 50 Hz seismic stimulation;

6. "f10Hz-a0.2-2-Decane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 10 Hz seismic stimulation;

7. "f20Hz-a0.4-2-Decane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 20 Hz seismic stimulation;

8. "f30Hz-a0.6-2-Decane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 30 Hz seismic stimulation;

9. "f40Hz-a0.8-2-Decane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 40 Hz seismic stimulation;

10. "f50Hz-a1.0-2-Decane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 50 Hz seismic stimulation;

11. "f10Hz-a0.2-2-Decane-ratio4.5.cine"- Original recorded video file of the decane droplet subjected to 10 Hz seismic stimulation;

12. "f20Hz-a0.4-2-Decane -ratio4.5.cine"- Original recorded video file of the decane droplet subjected to 20 Hz seismic stimulation;

13. "f30Hz-a0.6-2-Decane -ratio4.5.cine"- Original recorded video file of the decane droplet subjected to 30 Hz seismic stimulation;

14. "f40Hz-a0.8-2-Decane -ratio4.5.cine"- Original recorded video file of the decane droplet subjected to 40 Hz seismic stimulation;

15. "f50Hz-a1.0-2-Decane -ratio4.5.cine"- Original recorded video file of the decane droplet subjected to 50 Hz seismic stimulation;


**Dodecane (1.36 cP)**

1. "Initial Position-10Hz-2mm-dodecane-ratio4.5.bmp" – Initial position photo of the dodecane droplet subjected to 10 Hz seismic stimulation;

2. "Initial Position-20Hz-2mm-dodecane-ratio4.5.bmp" – Initial position photo of the dodecane droplet subjected to 20 Hz seismic stimulation;

3. "Initial Position-30Hz-2mm-dodecane-ratio4.5.bmp" – Initial position photo of the dodecane droplet subjected to 30 Hz seismic stimulation;

4. "Initial Position-40Hz-2mm-dodecane-ratio4.5.bmp" – Initial position photo of the dodecane droplet subjected to 40 Hz seismic stimulation;

5. "Initial Position-50Hz-2mm-dodecane-ratio4.5.bmp" – Initial position photo of the dodecane droplet subjected to 50 Hz seismic stimulation;

6. "f10Hz-a0.2-2-Dodecane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 10 Hz seismic stimulation;

7. "f20Hz-a0.4-2-Dodecane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 20 Hz seismic stimulation;

8. "f30Hz-a0.6-2-Dodecane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 30 Hz seismic stimulation;

9. "f40Hz-a0.8-2-Dodecane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 40 Hz seismic stimulation;

10. "f50Hz-a1.0-2-Dodecane-ratio4.5.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 50 Hz seismic stimulation;

11. "f10Hz-a0.2-2-Dodecane -ratio4.5.cine"- Original recorded video file of the dodecane droplet subjected to 10 Hz seismic stimulation;
12. "f20Hz-a0.4-2-Dodecane -ratio4.5.cine"- Original recorded video file of the dodecane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a0.6-2-Dodecane -ratio4.5.cine"- Original recorded video file of the dodecane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a0.8-2-Dodecane -ratio4.5.cine"- Original recorded video file of the dodecane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.0-2-Dodecane -ratio4.5.cine"- Original recorded video file of the dodecane droplet subjected to 50 Hz seismic stimulation;


**Mobilization**
**Hexane (0.3 cP)**
1. "Initial Position-10Hz-2mm-Hexane-ratio4.5-pass.bmp" – Initial position photo of the hexane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Hexane-ratio4.5-pass.bmp" – Initial position photo of the hexane droplet subjected to 20 Hz seismic stimulation;
3. "Initial Position-30Hz-2mm-Hexane-ratio4.5-pass.bmp" – Initial position photo of the hexane droplet subjected to 30 Hz seismic stimulation;
4. "Initial Position-40Hz-2mm-Hexane-ratio4.5-pass.bmp" – Initial position photo of the hexane droplet subjected to 40 Hz seismic stimulation;
5. "Initial Position-50Hz-2mm-Hexane-ratio4.5-pass.bmp" – Initial position photo of the hexane droplet subjected to 50 Hz seismic stimulation;
6. "10 hexane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 10 Hz seismic stimulation;
7. "20 hexane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 20 Hz seismic stimulation;
8. "30 hexane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 30 Hz seismic stimulation;
9. "40 hexane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 40 Hz seismic stimulation;
10. "50 hexane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 50 Hz seismic stimulation;
11. "f10Hz-a0.7-2-Hexane-ratio4.5-pass.cine"- Original recorded video file of the hexane droplet subjected to 10 Hz seismic stimulation;
12. "f20Hz-a0.8-2-Hexane-ratio4.5-pass.cine"- Original recorded video file of the hexane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a0.9-2-Hexane-ratio4.5-pass.cine"- Original recorded video file of the hexane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a1.0-2-Hexane-ratio4.5-pass.cine"- Original recorded video file of the hexane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.7-2-Hexane-ratio4.5-pass.cine"- Original recorded video file of the hexane droplet subjected to 50 Hz seismic stimulation;


**Decane (0.92 cP)**
1. "Initial Position-10Hz-2mm-Decane-ratio4.5-pass.bmp" – Initial position photo of the decane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Decane-ratio4.5-pass.bmp" – Initial position photo of the decane droplet subjected to 20 Hz seismic stimulation;

3. "Initial Position-30Hz-2mm-Decane-ratio4.5-pass.bmp" – Initial position photo of the decane droplet subjected to 30 Hz seismic stimulation;

4. "Initial Position-40Hz-2mm-Decane-ratio4.5-pass.bmp" – Initial position photo of the decane droplet subjected to 40 Hz seismic stimulation;

5. "Initial Position-50Hz-2mm-Decane-ratio4.5-pass.bmp" – Initial position photo of the decane droplet subjected to 50 Hz seismic stimulation;

6. "10 decane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 10 Hz seismic stimulation;

7. "20 decane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 20 Hz seismic stimulation;

8. "30 decane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 30 Hz seismic stimulation;

9. "40 decane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 40 Hz seismic stimulation;

10. "50 decane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 50 Hz seismic stimulation;

11. "f10Hz-a2.2-2-Decane-ratio4.5-pass.cine"- Original recorded video file of the decane droplet subjected to 10 Hz seismic stimulation;

12. "f20Hz-a1.6-2-Decane-ratio4.5-pass.cine"- Original recorded video file of the decane droplet subjected to 20 Hz seismic stimulation;

13. "f30Hz-a2.2-2-Decane-ratio4.5-pass.cine"- Original recorded video file of the decane droplet subjected to 30 Hz seismic stimulation;

14. "f40Hz-a1.6-2-Decane-ratio4.5-pass.cine"- Original recorded video file of the decane droplet subjected to 40 Hz seismic stimulation;

15. "f50Hz-a1.9-2-Decane-ratio4.5-pass.cine"- Original recorded video file of the decane droplet subjected to 50 Hz seismic stimulation;


**Dodecane (1.36 cP)**
1. "Initial Position-10Hz-2mm-Dodecane-ratio4.5-pass.bmp" – Initial position photo of the dodecane droplet subjected to 10 Hz seismic stimulation;

2. "Initial Position-20Hz-2mm-Dodecane-ratio4.5-pass.bmp" – Initial position photo of the dodecane droplet subjected to 20 Hz seismic stimulation;

3. "Initial Position-30Hz-2mm-Dodecane-ratio4.5-pass.bmp" – Initial position photo of the dodecane droplet subjected to 30 Hz seismic stimulation;

4. "Initial Position-40Hz-2mm-Dodecane-ratio4.5-pass.bmp" – Initial position photo of the dodecane droplet subjected to 40 Hz seismic stimulation;

5. "Initial Position-50Hz-2mm-Dodecane-ratio4.5-pass.bmp" – Initial position photo of the dodecane droplet subjected to 50 Hz seismic stimulation;

6. "10 dodecane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 10 Hz seismic stimulation;

7. "20 dodecane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 20 Hz seismic stimulation;

8. "30 dodecane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 30 Hz seismic stimulation;

9. "40 dodecane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 40 Hz seismic stimulation;

10. "50 dodecane ratio 4.5 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 50 Hz seismic stimulation;

11. "f10Hz-a1.2-2-Dodecane-ratio4.5-pass.cine"- Original recorded video file of the dodecane droplet subjected to 10 Hz seismic stimulation;

12. "f20Hz-a0.7-2-Dodecane-ratio4.5-pass.cine"- Original recorded video file of the dodecane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a1.2-2-Dodecane-ratio4.5-pass.cine"- Original recorded video file of the dodecane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a0.9-2-Dodecane-ratio4.5-pass.cine"- Original recorded video file of the dodecane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.1-2-Dodecane-ratio4.5-pass.cine"- Original recorded video file of the dodecane droplet subjected to 50 Hz seismic stimulation;


**Files at Aspect ratio of 9**
**Oscillation**
**Hexane (0.3 cP)**
1. "Initial Position-10Hz-2mm-Hexane-ratio9.bmp" – Initial position photo of the hexane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Hexane-ratio9.bmp" – Initial position photo of the hexane droplet subjected to 20 Hz seismic stimulation;
3. "Initial Position-30Hz-2mm-Hexane-ratio9.bmp" – Initial position photo of the hexane droplet subjected to 30 Hz seismic stimulation;
4. "Initial Position-40Hz-2mm-Hexane-ratio9.bmp" – Initial position photo of the hexane droplet subjected to 40 Hz seismic stimulation;
5. "Initial Position-50Hz-2mm-Hexane-ratio9.bmp" – Initial position photo of the hexane droplet subjected to 50 Hz seismic stimulation;
6. "f10Hz-a0.2-2-Hexane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 10 Hz seismic stimulation;
7. "f20Hz-a0.4-2-Hexane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 20 Hz seismic stimulation;
8. "f30Hz-a0.6-2-Hexane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 30 Hz seismic stimulation;
9. "f40Hz-a0.8-2-Hexane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 40 Hz seismic stimulation;
10. "f50Hz-a1.0-2-Hexane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 50 Hz seismic stimulation;
11. "f10Hz-a0.2-2-Hexane-ratio9.cine"- Original recorded video file of the hexane droplet subjected to 10 Hz seismic stimulation;
12. "f20Hz-a0.4-2-Hexane-ratio9.cine"- Original recorded video file of the hexane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a0.6-2-Hexane-ratio9.cine"- Original recorded video file of the hexane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a0.8-2-Hexane-ratio9.cine"- Original recorded video file of the hexane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.0-2-Hexane-ratio9.cine"- Original recorded video file of the hexane droplet subjected to 50 Hz seismic stimulation;


**Decane (0.92 cP)**
1. "Initial Position-10Hz-2mm-Decane-ratio9.bmp" – Initial position photo of the decane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Decane-ratio9.bmp" – Initial position photo of the decane droplet subjected to 20 Hz seismic stimulation;

3. "Initial Position-30Hz-2mm-Decane-ratio9.bmp" – Initial position photo of the decane droplet subjected to 30 Hz seismic stimulation;
4. "Initial Position-40Hz-2mm-Decane-ratio9.bmp" – Initial position photo of the decane droplet subjected to 40 Hz seismic stimulation;
5. "Initial Position-50Hz-2mm-Decane-ratio9.bmp" – Initial position photo of the decane droplet subjected to 50 Hz seismic stimulation;
6. "f10Hz-a0.2-2-Decane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 10 Hz seismic stimulation;
7. "f20Hz-a0.4-2-Decane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 20 Hz seismic stimulation;
8. "f30Hz-a0.6-2-Decane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 30 Hz seismic stimulation;
9. "f40Hz-a0.8-2-Decane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 40 Hz seismic stimulation;
10. "f50Hz-a1.0-2-Decane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 50 Hz seismic stimulation;
11. "f10Hz-a0.2-2-Decane-ratio9.cine"- Original recorded video file of the decane droplet subjected to 10 Hz seismic stimulation;
12. "f20Hz-a0.4-2-Decane -ratio9.cine"- Original recorded video file of the decane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a0.6-2-Decane -ratio9.cine"- Original recorded video file of the decane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a0.8-2-Decane -ratio9.cine"- Original recorded video file of the decane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.0-2-Decane -ratio9.cine"- Original recorded video file of the decane droplet subjected to 50 Hz seismic stimulation;


**Dodecane (1.36 cP)**
1. "Initial Position-10Hz-2mm-Dodecane-ratio9.bmp" – Initial position photo of the dodecane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Dodecane-ratio9.bmp" – Initial position photo of the dodecane droplet subjected to 20 Hz seismic stimulation;
3. "Initial Position-30Hz-2mm-Dodecane-ratio9.bmp" – Initial position photo of the dodecane droplet subjected to 30 Hz seismic stimulation;
4. "Initial Position-40Hz-2mm-Dodecane-ratio9.bmp" – Initial position photo of the dodecane droplet subjected to 40 Hz seismic stimulation;
5. "Initial Position-50Hz-2mm-Dodecane-ratio9.bmp" – Initial position photo of the dodecane droplet subjected to 50 Hz seismic stimulation;
6. "f10Hz-a0.2-2-Dodecane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 10 Hz seismic stimulation;
7. "f20Hz-a0.4-2-Dodecane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 20 Hz seismic stimulation;
8. "f30Hz-a0.6-2-Dodecane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 30 Hz seismic stimulation;
9. "f40Hz-a0.8-2-Dodecane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 40 Hz seismic stimulation;
10. "f50Hz-a1.0-2-Dodecane-ratio9.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 50 Hz seismic stimulation;
11. "f10Hz-a0.2-2-Dodecane -ratio9.cine"- Original recorded video file of the dodecane droplet subjected to 10 Hz seismic stimulation;

12. "f20Hz-a0.4-2-Dodecane -ratio9.cine"- Original recorded video file of the dodecane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a0.6-2-Dodecane -ratio9.cine"- Original recorded video file of the dodecane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a0.8-2-Dodecane -ratio9.cine"- Original recorded video file of the dodecane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a1.0-2-Dodecane -ratio9.cine"- Original recorded video file of the dodecane droplet subjected to 50 Hz seismic stimulation;

**Mobilization**
**Hexane (0.3 cP)**
1. "Initial Position-10Hz-2mm-Hexane-ratio9-pass.bmp" – Initial position photo of the hexane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Hexane-ratio9-pass.bmp" – Initial position photo of the hexane droplet subjected to 20 Hz seismic stimulation;
3. "Initial Position-30Hz-2mm-Hexane-ratio9-pass.bmp" – Initial position photo of the hexane droplet subjected to 30 Hz seismic stimulation;
4. "Initial Position-40Hz-2mm-Hexane-ratio9-pass.bmp" – Initial position photo of the hexane droplet subjected to 40 Hz seismic stimulation;
5. "Initial Position-50Hz-2mm-Hexane-ratio9-pass.bmp" – Initial position photo of the hexane droplet subjected to 50 Hz seismic stimulation;
6. "10 hexane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 10 Hz seismic stimulation;
7. "20 hexane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 20 Hz seismic stimulation;
8. "30 hexane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 30 Hz seismic stimulation;
9. "40 hexane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 40 Hz seismic stimulation;
10. "50 hexane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the hexane droplet subjected to 50 Hz seismic stimulation;
11. "f10Hz-a0.6-2-Hexane-ratio9-pass.cine"- Original recorded video file of the hexane droplet subjected to 10 Hz seismic stimulation;
12. "f20Hz-a0.6-2-Hexane-ratio9-pass.cine"- Original recorded video file of the hexane droplet subjected to 20 Hz seismic stimulation;
13. "f30Hz-a1.2-2-Hexane-ratio9-pass.cine"- Original recorded video file of the hexane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a2.2-2-Hexane-ratio9-pass.cine"- Original recorded video file of the hexane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a2.4-2-Hexane-ratio9-pass.cine"- Original recorded video file of the hexane droplet subjected to 50 Hz seismic stimulation;


**Decane (0.92 cP)**
1. "Initial Position-10Hz-2mm-Decane-ratio9-pass.bmp" – Initial position photo of the decane droplet subjected to 10 Hz seismic stimulation;
2. "Initial Position-20Hz-2mm-Decane-ratio9-pass.bmp" – Initial position photo of the decane droplet subjected to 20 Hz seismic stimulation;
3. "Initial Position-30Hz-2mm-Decane-ratio9-pass.bmp" – Initial position photo of the decane droplet subjected to 30 Hz seismic stimulation;

4. "Initial Position-40Hz-2mm-Decane-ratio9-pass.bmp" – Initial position photo of the decane droplet subjected to 40 Hz seismic stimulation;

5. "Initial Position-50Hz-2mm-Decane-ratio9-pass.bmp" – Initial position photo of the decane droplet subjected to 50 Hz seismic stimulation;

6. "10 decane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 10 Hz seismic stimulation;

7. "20 decane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 20 Hz seismic stimulation;

8. "30 decane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 30 Hz seismic stimulation;

9. "40 decane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 40 Hz seismic stimulation;

10. "50 decane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the decane droplet subjected to 50 Hz seismic stimulation;

11. "f10Hz-a1.0-2-Decane-ratio9-pass.cine"- Original recorded video file of the decane droplet subjected to 10 Hz seismic stimulation;

12. "f20Hz-a1.3-2-Decane-ratio9-pass.cine"- Original recorded video file of the decane droplet subjected to 20 Hz seismic stimulation;

13. "f30Hz-a1.0-2-Decane-ratio9-pass.cine"- Original recorded video file of the decane droplet subjected to 30 Hz seismic stimulation;

14. "f40Hz-a1.0-2-Decane-ratio9-pass.cine"- Original recorded video file of the decane droplet subjected to 40 Hz seismic stimulation;

15. "f50Hz-a4.0-2-Decane-ratio9-pass.cine"- Original recorded video file of the decane droplet subjected to 50 Hz seismic stimulation;


**Dodecane (1.36 cP)**

1. "Initial Position-10Hz-2mm-Dodecane-ratio9-pass.bmp" – Initial position photo of the dodecane droplet subjected to 10 Hz seismic stimulation;

2. "Initial Position-20Hz-2mm-Dodecane-ratio9-pass.bmp" – Initial position photo of the dodecane droplet subjected to 20 Hz seismic stimulation;

3. "Initial Position-30Hz-2mm-Dodecane-ratio9-pass.bmp" – Initial position photo of the dodecane droplet subjected to 30 Hz seismic stimulation;

4. "Initial Position-40Hz-2mm-Dodecane-ratio9-pass.bmp" – Initial position photo of the dodecane droplet subjected to 40 Hz seismic stimulation;

5. "Initial Position-50Hz-2mm-Dodecane-ratio9-pass.bmp" – Initial position photo of the dodecane droplet subjected to 50 Hz seismic stimulation;

6. "10 dodecane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 10 Hz seismic stimulation;

7. "20 dodecane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 20 Hz seismic stimulation;

8. "30 dodecane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 30 Hz seismic stimulation;

9. "40 dodecane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 40 Hz seismic stimulation;

10. "50 dodecane ratio 9 pass test.pps"– manual-tracked datapoint (.pps format) file of the dodecane droplet subjected to 50 Hz seismic stimulation;

11. "f10Hz-a0.9-2-Dodecane-ratio9-pass.cine"- Original recorded video file of the dodecane droplet subjected to 10 Hz seismic stimulation;

12. "f20Hz-a1.2-2-Dodecane-ratio9-pass.cine"- Original recorded video file of the dodecane droplet subjected to 20 Hz seismic stimulation;

13. "f30Hz-a1.2-2-Dodecane-ratio9-pass.cine"- Original recorded video file of the dodecane droplet subjected to 30 Hz seismic stimulation;
14. "f40Hz-a1.0-2-Dodecane-ratio9-pass.cine"- Original recorded video file of the dodecane droplet subjected to 40 Hz seismic stimulation;
15. "f50Hz-a3.0-2-Dodecane-ratio9-pass.cine"- Original recorded video file of the dodecane droplet subjected to 50 Hz seismic stimulation;

**Reference**
Beresnev, I. A. (2006), Theory of vibratory mobilization on nonwetting fluids entrapped in pore constrictions, *Geophysics*, *71*(6), N47-N56.
Deng, W., and M. B. Cardenas (2013), Dynamics and dislodgment from pore constrictions of a trapped nonwetting droplet stimulated by seismic waves, *Water Resources Research*, *49*(7), 4206-4218.
Gauglitz, P., and C. Radke (1989), Dynamics of Haines jumps for compressible bubbles in constricted capillaries, *AIChE journal*, *35*(2), 230-240.