

# Data description:

The datasets presented here belong to an investigation of the elasticity and conicity of porous silicon (pSi) in a dry and squalene filled state. pSi is compared to wafer quality p+ doped bulk silicon.

The porous silicon membrane is synthesized by electrochemical etching in HF. It has a pore radius of 37 nm, a porosity of 55%, a density of 1281 g/cm<sup>3</sup> and a thickness of 105 μm. The silicon sample has a density of 2329 g/cm<sup>3</sup> and a thickness of 525 μm. The filling fraction of the squalene filled membrane is 80 %. Squalene's density is 0.807 g/cm<sup>3</sup>.

The data is acquired in a laser ultrasonic setup. Guided waves are excited on the samples by a pulsed UV Laser. A stabilized Michelson interferometer detects the out-of-plane displacement of the sample on different positions relative to the excitation center. The acquired data with direct space and time dependency is saved by the control software as textfiles and converted to MAT-files for easier handling.

The data is processed and 2-D Fourier transformed to reciprocal space. The data is given as MAT-files only.

The data for the different materials can be found in the sourcedata(1).zip and sourcedata(2).zip file in the following files:

Material	Measured data	Processed 2-D FFT data
Bulk Silicon	Si_rawdata.txt, Si_rawdata.mat	Si_fft_processed.mat
Porous Silicon (Dry)	pSi_rawdata.txt, pSi_rawdata.mat	pSi_fft_processed.mat
Porous Silicon (Squalene)	pSi_squalane_rawdata.txt, pSi_squalane_rawdata.mat	pSi_squalane_fft_processed.mat

The data can be found on the TUHH Data Collection: <https://doi.org/10.15480/336.3174>

Corresponding author: Patrick Huber ([patrick.huber@tuhh.de](mailto:patrick.huber@tuhh.de))  
<https://orcid.org/0000-0002-2126-9100>