Water Fountain Speed and Height at Strokkur Geyser, Iceland, derived from Video Camera Data

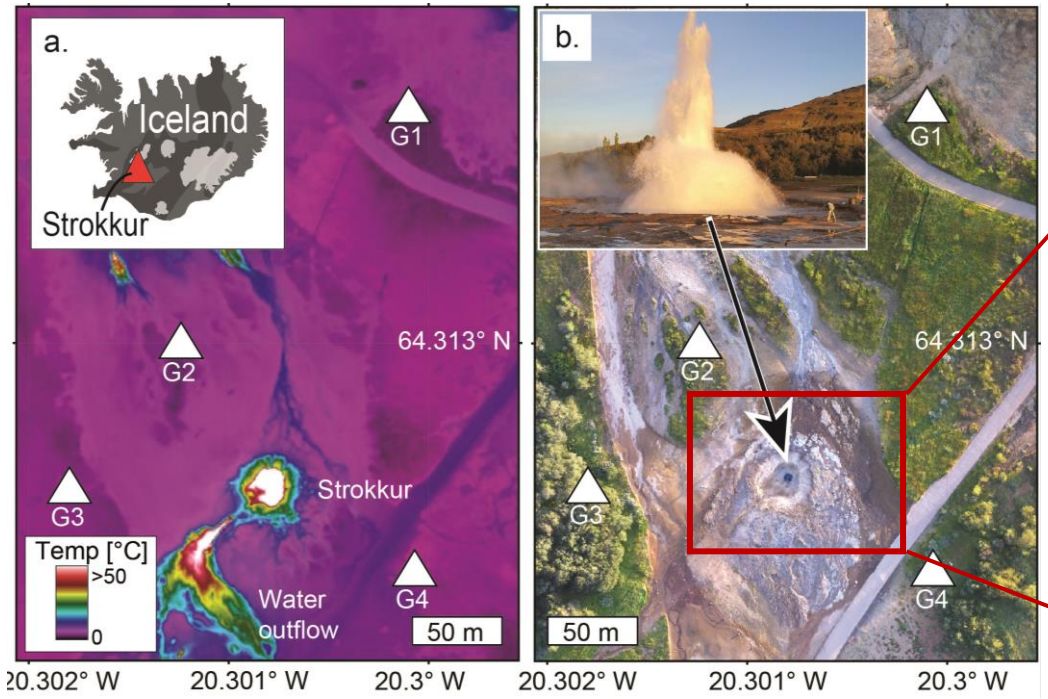
Sandeep Karmacharya[1], Eva P. S. Eibl[1], Alina Shevchenko[2], Thomas Walter[2], Gylfi Páll Hersir[3,4]

1: Institute of Geosciences, University of Potsdam, Karl-Liebknecht-Str. 24-25, 14476 Potsdam, Germany

2: GFZ, German Research Centre for Geosciences, Telegrafenberg, 14473 Potsdam, Germany

3: ISOR, Iceland GeoSurvey, Urdarhvarf 8, Reykjavik, Iceland

4: Reykjavik, Iceland, gylfi.pall@outlook.com



Eibl, Karmacharya et al. in prep.

sandeep.karmacharya@uni-potsdam.de

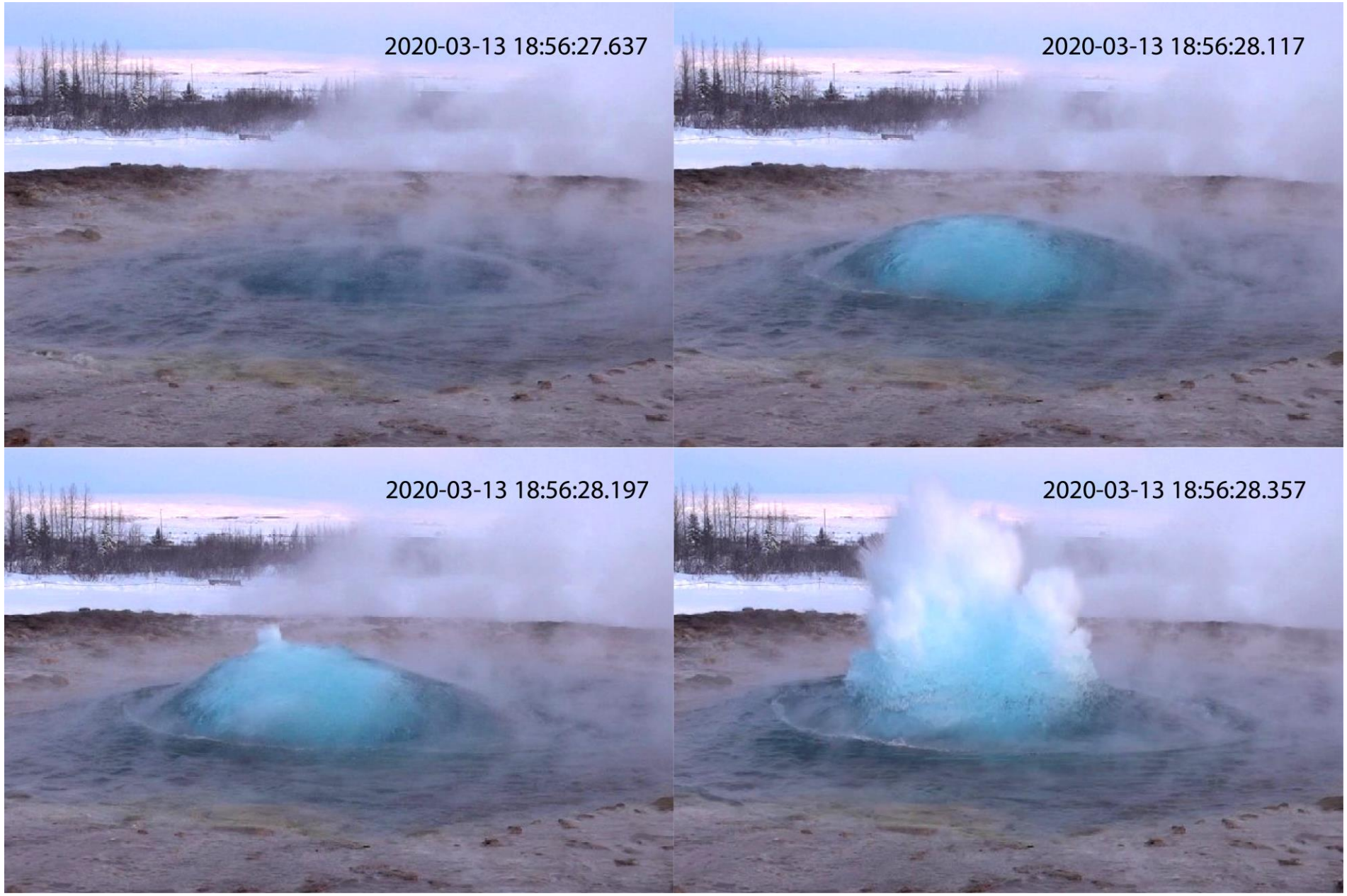
eva.eibl@uni-potsdam.de

Recording water fountains using two video cameras

- Resolution: 25 frames per second, 1920 x 1080 pixels using SONY DSC-RX100M3
- The video was converted to images (https://github.com/karma0san/video-frame-extractor) using the ffmpeg plugin
- Pixel to meter conversion using a pole on the video recording
- ImageJ with MtrackJ was used to determine the height of the bulge

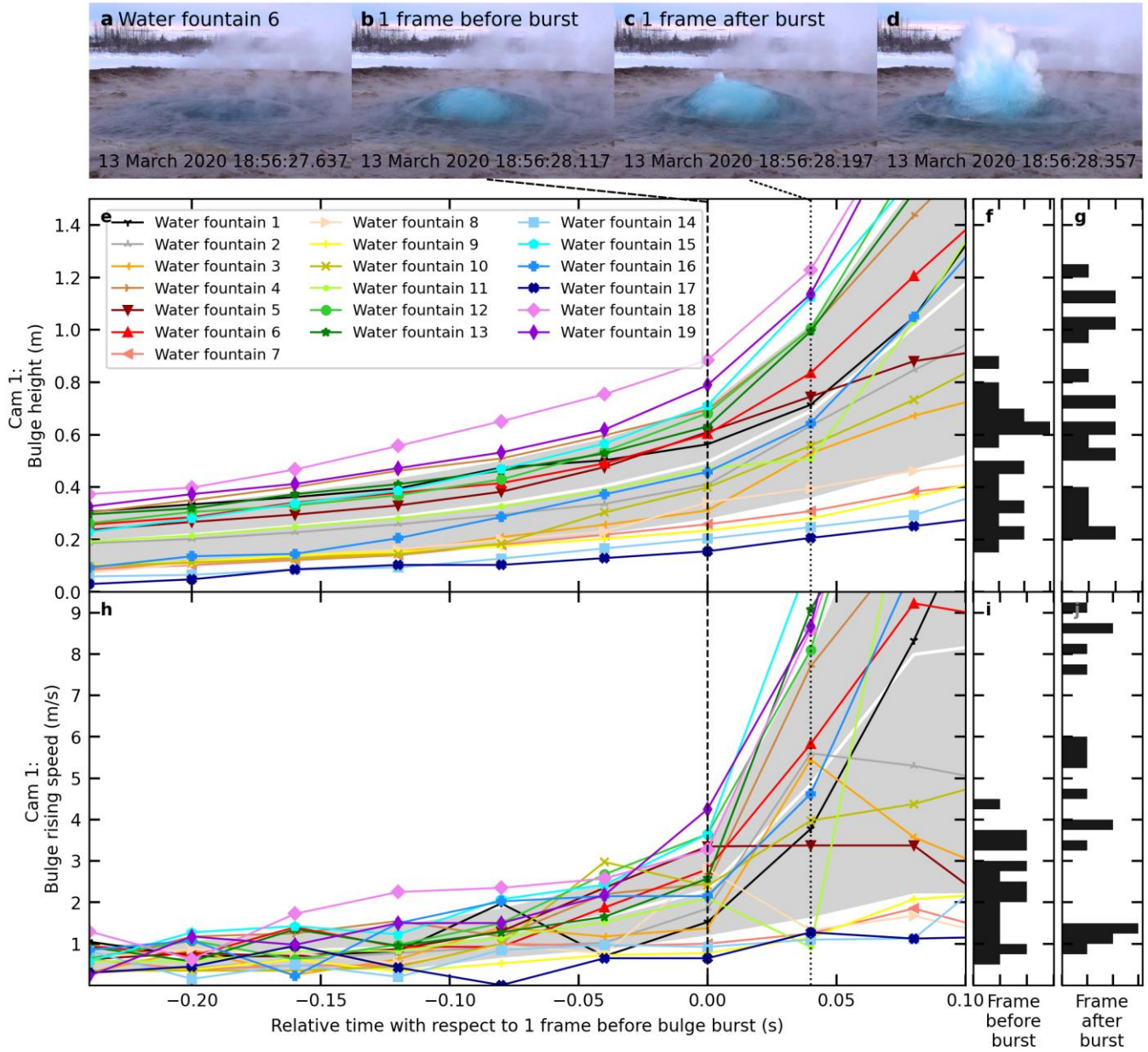
sandeep.karmacharya@uni-potsdam.de eva.eibl@uni-potsdam.de

A water bulge forms before the eruption starts



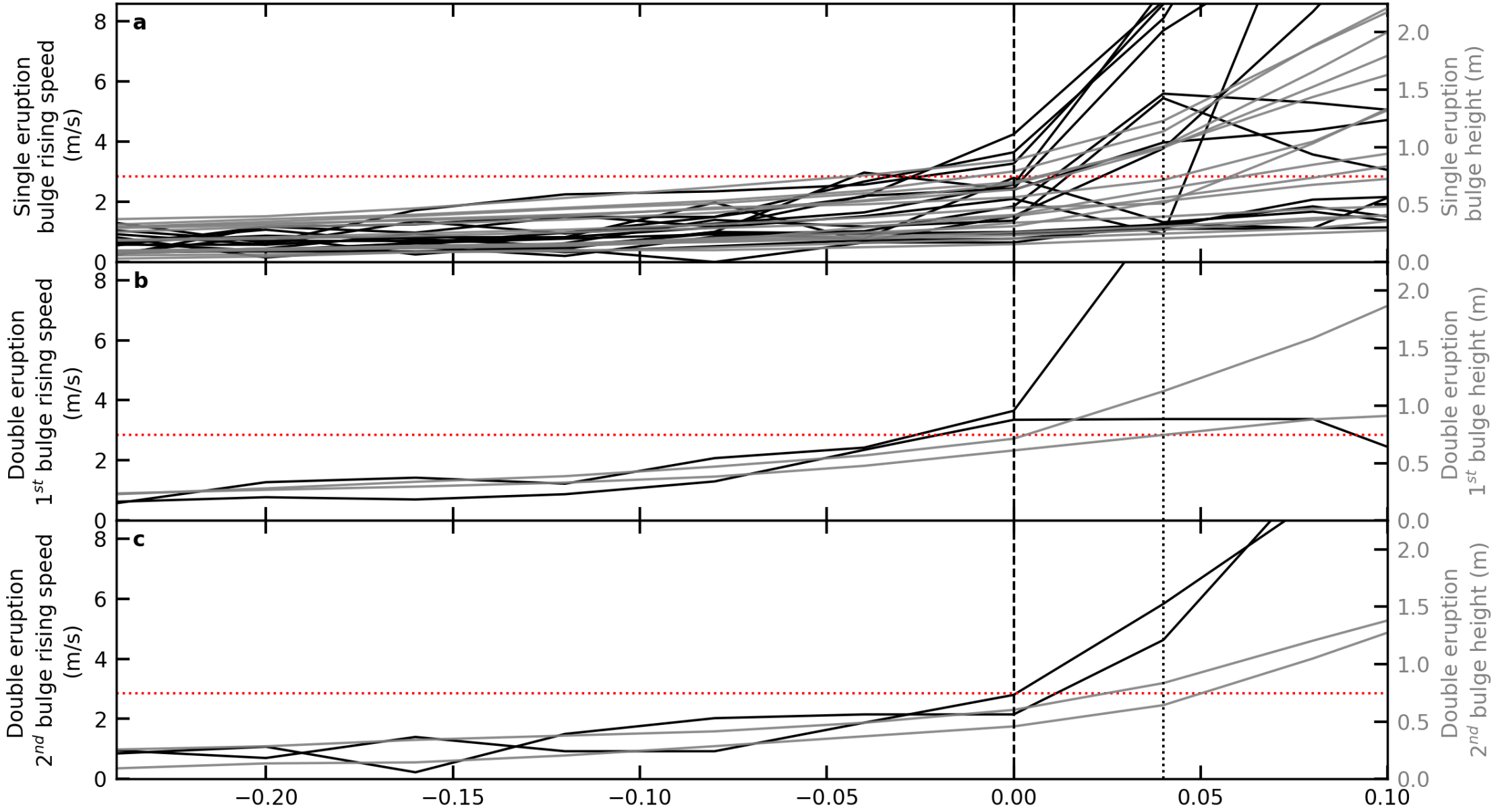
sandeep.karmacharya@uni-potsdam.de
eva.eibl@uni-potsdam.de

The bulge reaches a mean height of 0.50 m at a speed of 2.29 m/s



sandeep.karmacharya@uni-potsdam.de
eva.eibl@uni-potsdam.de

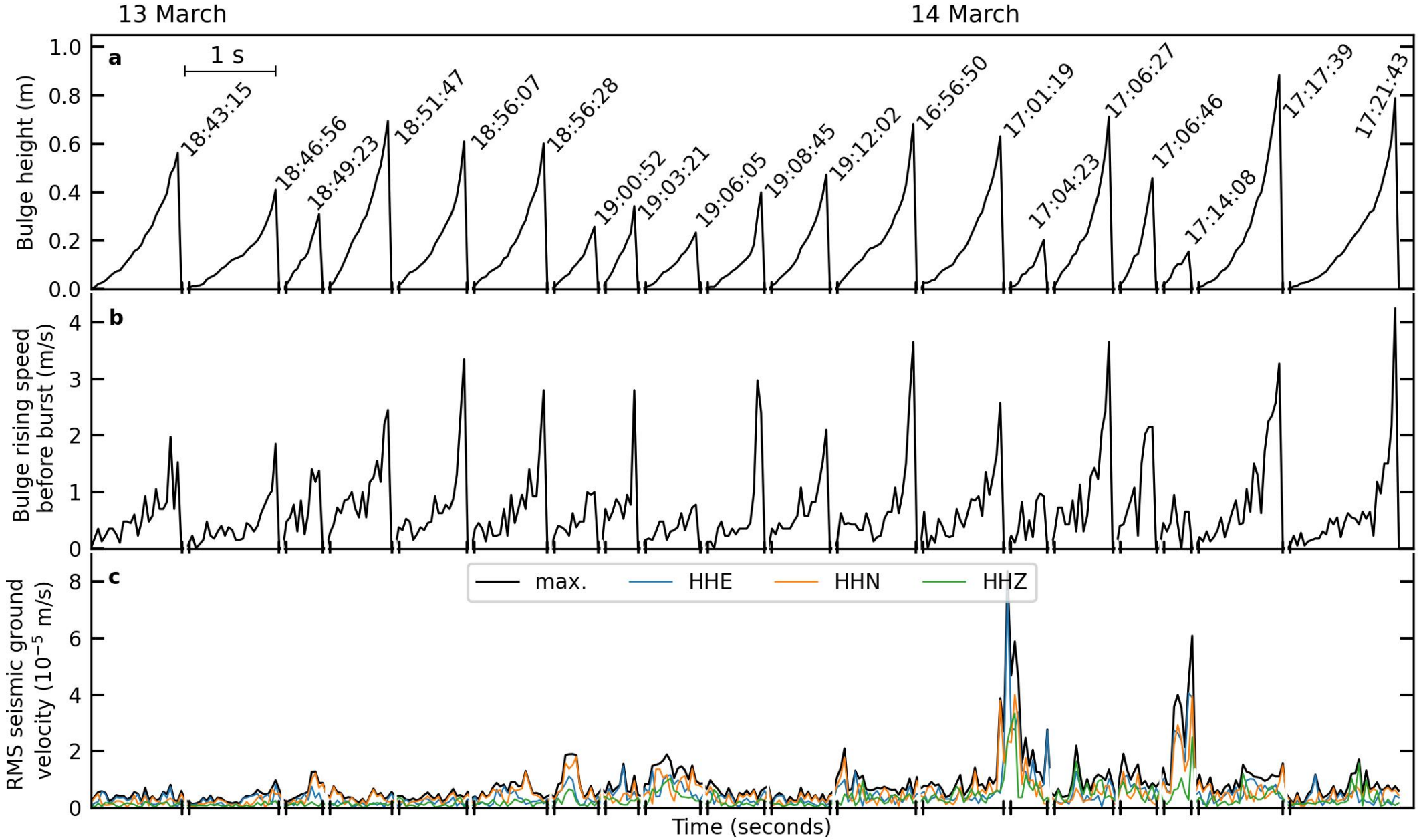
The first bulge in a double eruption rises faster



sandeep.karmacharya@uni-potsdam.de

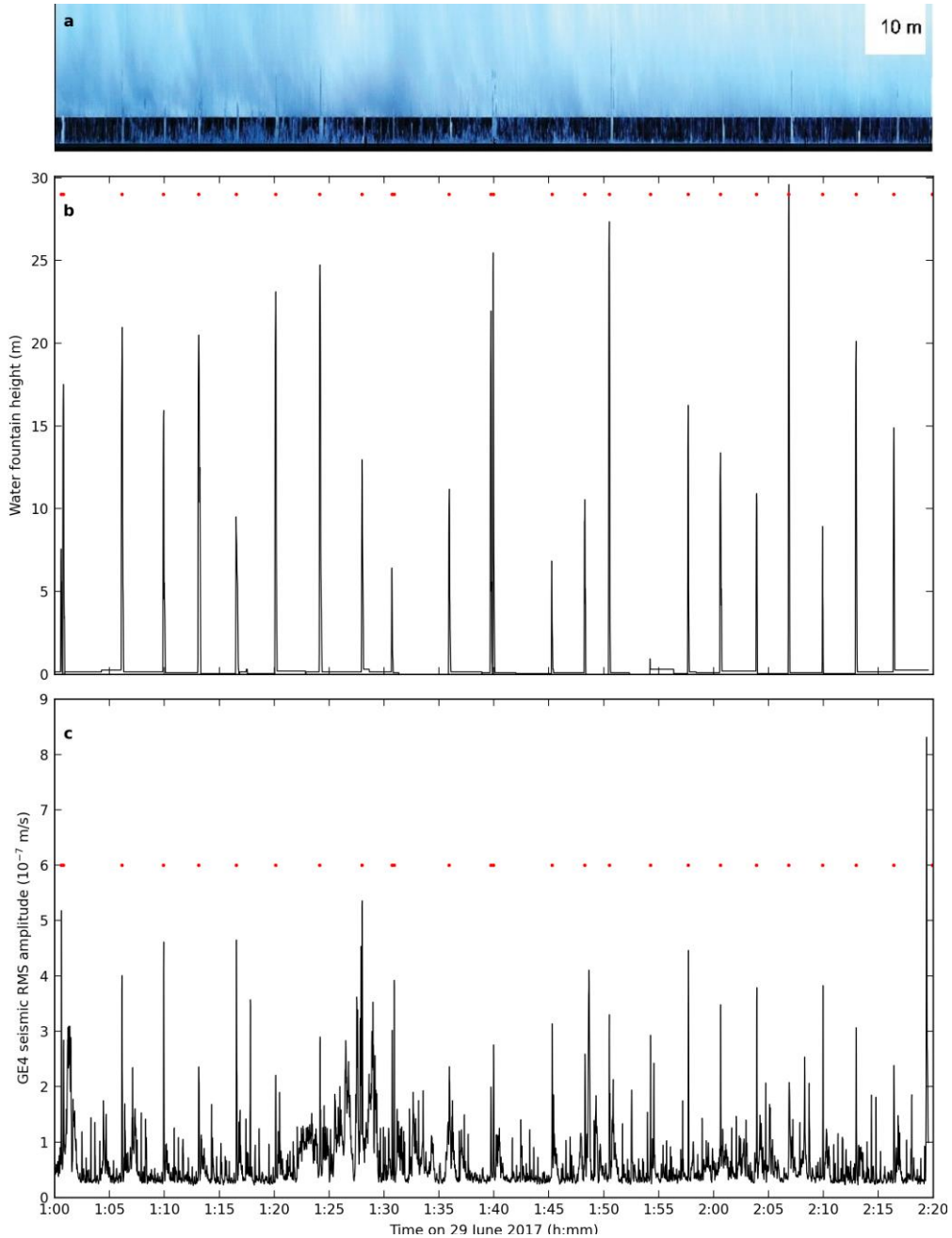
eva.eibl@uni-potsdam.de

The bulge forms in 0.5 to 1.3 seconds



sandeep.karmacharya@uni-potsdam.de
eva.eibl@uni-potsdam.de

Fountains reach up to 40 m height while seismic amplitude remains low

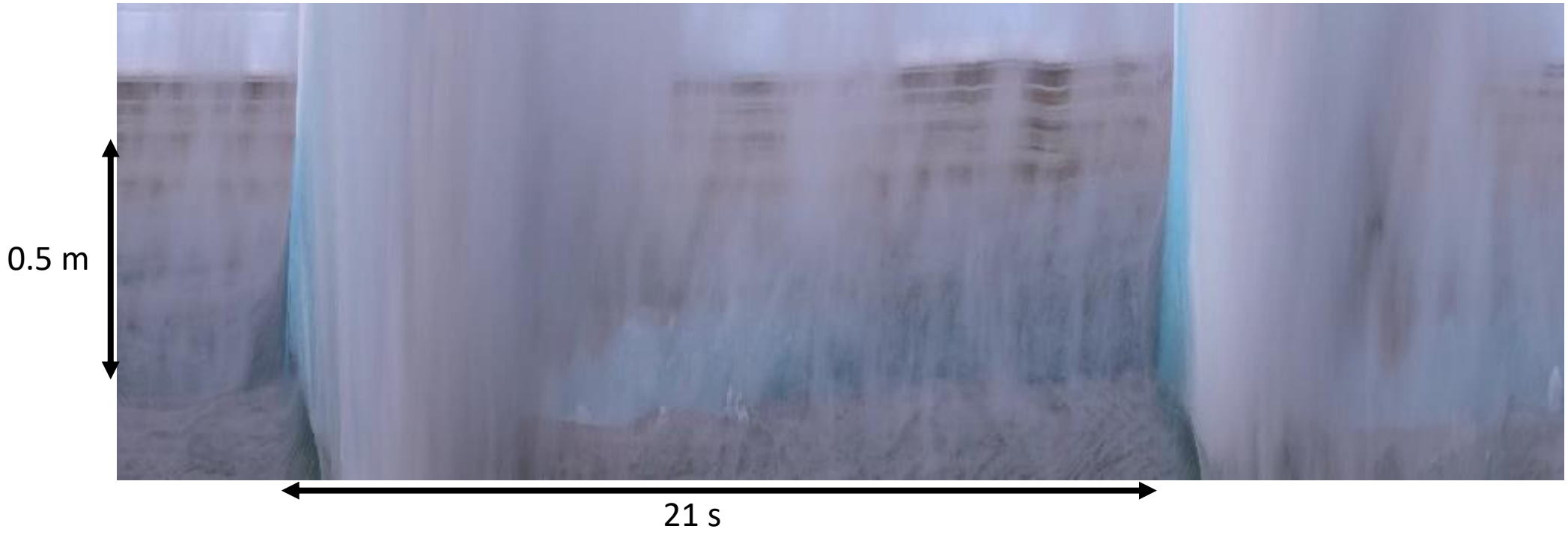


sandeep.karmacharya@uni-potsdam.de

eva.eibl@uni-potsdam.de

Conclusion

- Derived speeds are consistent with speed derived for steam bubbles rising in water
- Derived speeds are possibly consistent with changes in seismic source location
- Rising speeds escalate when the bulge bursts into the water fountain
- Seismic amplitudes seem to not correlate with the bulge height or eruption height



sandeep.karmacharya@uni-potsdam.de
eva.eibl@uni-potsdam.de