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Multiparametric measurements of the lava lake at Masaya volcano

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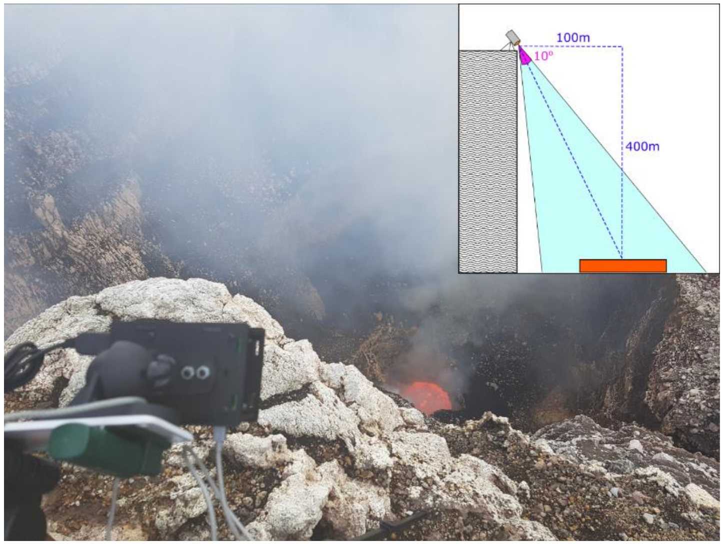
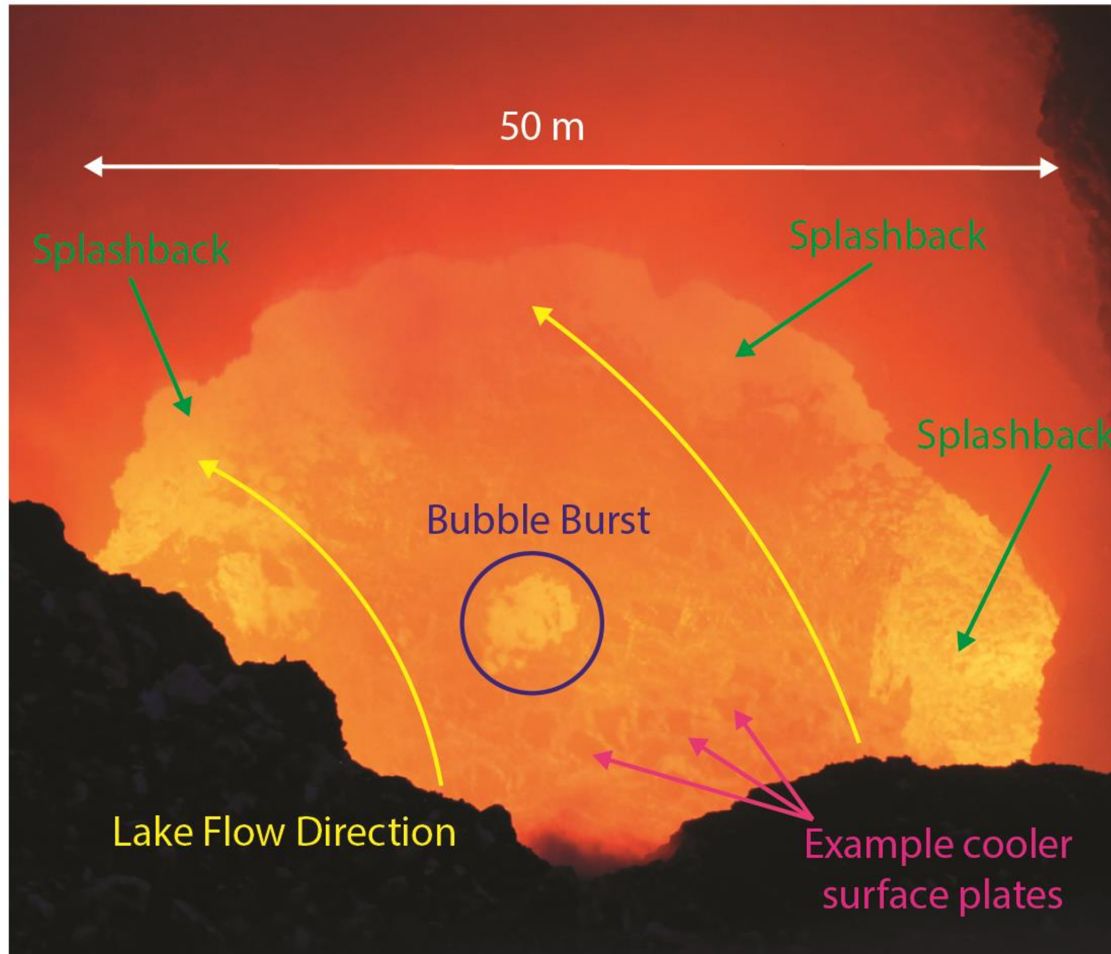
Masaya Lava Lake



- An intriguing lava lake with interesting characteristics:



- Behaviour investigated with multiparametric study (web-links):
  - [Video]
  - [Thermal Camera]
  - [UV Cameras]

Pering et al. 2019. A Rapidly Convecting Lava Lake at Masaya Volcano, Nicaragua. Front. Earth Sci., https://doi.org/10.3389/feart.2018.00241

Combined low-cost approach

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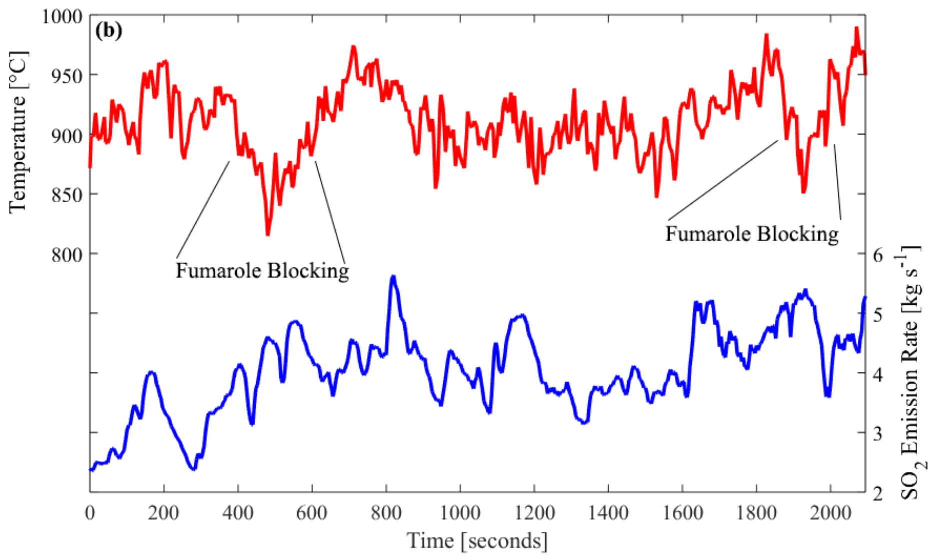
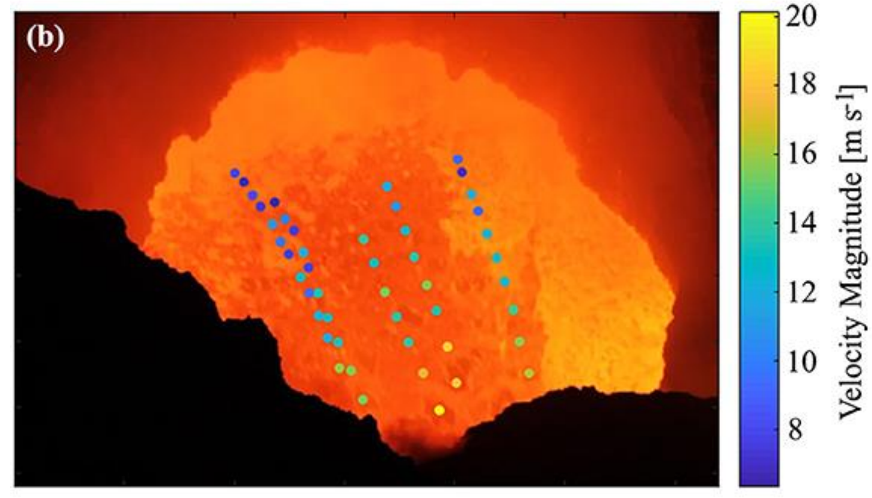
- Multiple datasets to investigate links:

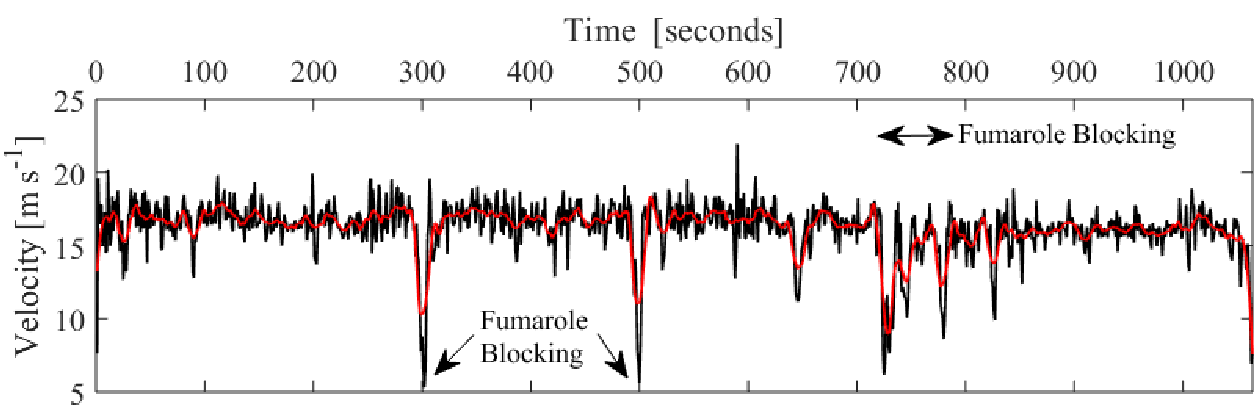


Thermal & SO_2 Emission Rates



Video: spatial changes + bubbles

Velocity



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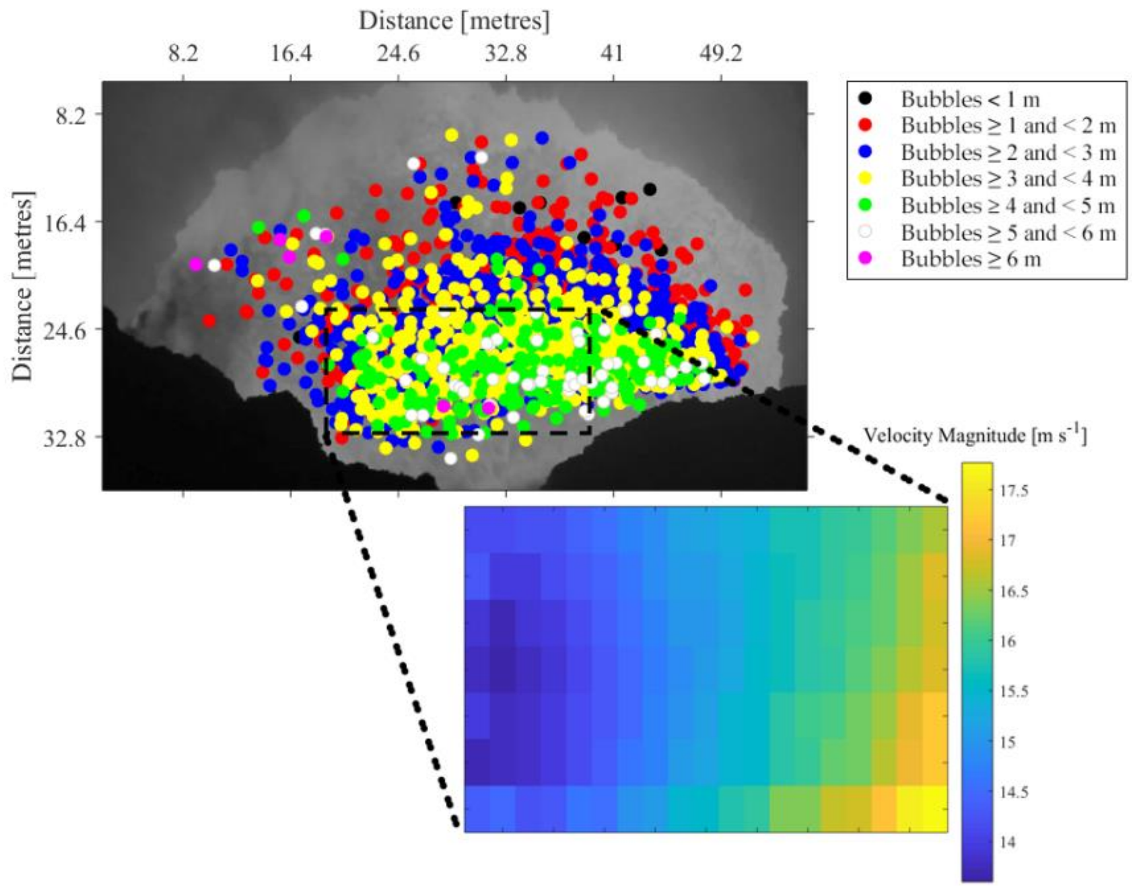
Combined low-cost approach

- Video allows velocity, bubble size and burst location mapping.
  - Lake slows down after entry into field of view.
  - Larger bubbles burst ‘upstream’ of flow direction.



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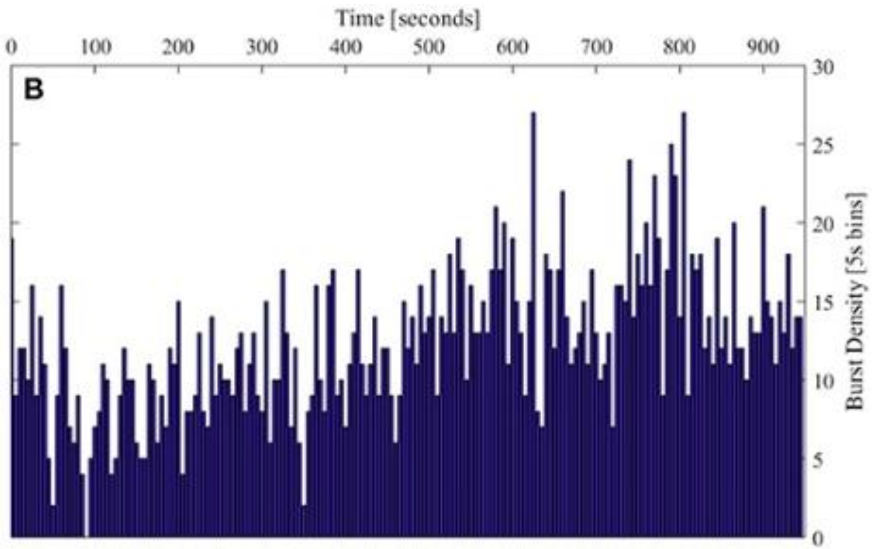
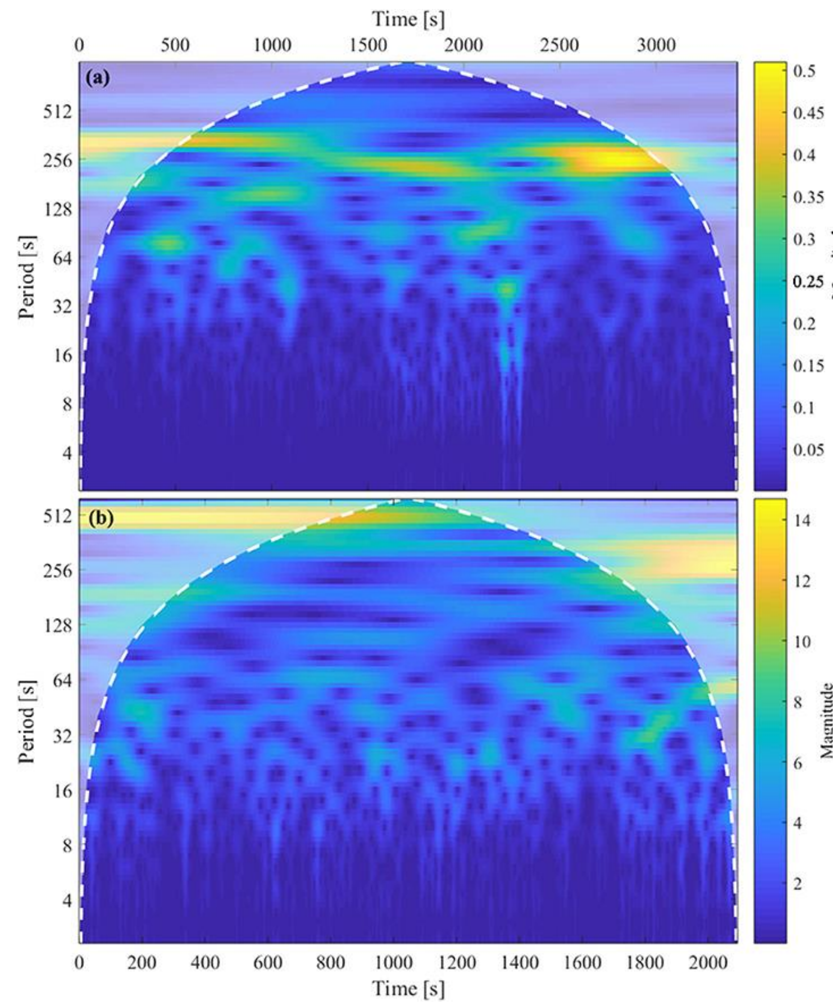
No Shared Patterns in Data

- No clear pattern in bubble bursts on lake surface and no shared periodic components in gas and thermal data.





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Summary

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- High flow velocities of 13.7–16.4 m s^{-1} and unusual surface flow behavior.
- Video derived bubble burst diameters range 0.6–8 m.
- 200-300s periodicity in SO_2 not shared in any other dataset – likely generated atmospherically.
- Possible model (right) involves lake as skylight.
- For full details see Pering et al. (2019).