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Illuminating magma shearing processes via synchrotron imaging

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Our understanding of geomaterial behaviour and processes has long fallen short due to inaccessibility into material as "something" happens. In volcanology, research strategies have increasingly sought to illuminate the subsurface of materials at all scales, from the use of muon tomography to image the inside of volcanoes to the use of seismic tomography to image magmatic bodies in the crust, and most recently, we have added synchrotron-based x-ray tomography to image the inside of material as we test it under controlled conditions. Here, we will explore some of the novel findings made on the evolution of magma during shearing. These will include observations and discussions of magma flow and failure as well as petrological reaction kinetics.