

Shear-Wave Splitting

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Shear-Wave Splitting Latest News

The University of Oxford scientists have proposed a new method for monitoring volcanic eruptions using a seismic phenomenon called shear-wave splitting at Mount Ontake, Japan.

What is Shear-Wave Splitting?

- **Shear-wave splitting** refers to the **phenomenon where seismic shear waves travel at different speeds** based on their **polarisation**, especially when passing through **aligned cracks or fractures** in rocks.
- As **magma and volcanic fluids** move underground, they **alter stress conditions**, causing cracks in surrounding rocks to **open or close**. These changes **affect the speed and direction of shear-waves**, which scientists can monitor.
- The **degree of shear-wave splitting increases** when **internal pressure builds up**, offering a **potential early-warning signal** for impending eruptions.

About Mount Ontake

- **Mount Ontake** is an **active stratovolcano** located in **Honshū Island, Central Japan**, near Tokyo. It is Japan's **second-highest volcano** and part of the **Pacific Ring of Fire**.
- The volcano experienced a **deadly phreatic (steam-driven) eruption in 2014**, which occurred **without significant seismic warning**, killing over 60 people, most of whom were hikers.
- **Phreatic eruptions** are **hydrothermal explosions** caused by **steam pressure** and **do not involve new magma**, making them **hard to predict** with conventional methods.

Source: **PHY**

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