

Pie-shaped and dome-shaped submarine mud volcanoes

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Mud volcanoes can be viewed as natural tectonic conduits that bring up deep substances and fluids motivated by overpressuring at deep depths. Thus, mud volcanoes are useful tools to explore processes in fluid migration and material cycling. Large number of studies of the mud volcanism on Earth has been conducted, and about 300 offshore mud volcanoes had been confirmed and the double had been inferred around a decade ago. Nevertheless, so far, quantitative and statistical studies of mud volcano morphology have been mostly restricted to onshore mud volcanoes on Earth and mud volcano-like structure imaged on Mars. Herein we globally compile heights and radii of offshore mud volcanoes using bathymetric data and literatures. The compilation is forwarded to estimate a mean volume of episodic mud eruptions from the mud volcano based on authoritative studies into granular flows. The volumes are estimated in the function of the ratio of height over basal radius of mud volcano's body. Nearly all found offshore mud volcanoes are definitely proved to be polygenic. Moreover, an individual erupted volume from the pie-shaped mud volcano has a couple of orders of magnitude larger than the one from the dome-shaped one. A frequent occurrence of pie-shaped mud volcanoes, discovered in the accretionary margins characterized by high sediment influxes, is likely resulted from being efficient players for escaping large amount of fluidized sediments to reach the seafloor.

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