

## Spatial relationship between the volcanic chain and high gravity anomalies in subduction zones

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The most conspicuous features of arc-trench systems are active seismicity, characteristic topography and gravity anomalies, and volcanism. The topography and gravity anomalies are low in the trench and high in the arc, which can be theoretically explained by mechanical interaction between the subducting oceanic plate and the overriding plate (Sato & Matsu'ura, 1993, GJI; Hashimoto et al, 2004, PAGEOPH). Because the topography is more complicated to be understood, free-air gravity anomaly is more suitable to be compared to the theoretical model. Free-air gravity anomalies with long wave length basically represent the effect of tectonic force, which disturbs gravity equilibrium.

Volcanoes align along the volcanic front in most arcs. Since both of the high free-air gravity anomalies and volcanic front have a subparallel strike to the trench, it should be possible to classify arc-trench systems according to the spatial relationship between them. Based on such an idea, Fukahata (2008, JPGU meeting) classified arc-trench systems, but there was a problem that the recognition of the location of high gravity anomalies was quite subjective. So, in this study, I improved this process.; the location of high gravity anomalies were more quantitatively recognized. As a result, the location of high gravity anomalies relative to the volcanic front did not change for most arcs, but I found that it was difficult to define its location in some arcs (mostly tensile). Using the result, I discuss the spatial relationship between the volcanic chain and high gravity anomalies in subduction zones and consider causes of topographic evolution of island arcs.

Keywords: island arc, subduction zone, gravity anomaly, volcanic front