Correlations between subduction of linear oceanic features and arc volcanism volume around the Pacific basin

Supplementary material

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The supplementary material contains additional information about the volcano database used in this study. We also provide a database that allows the comparison between our arc volcanoes volume density and other geophysical data and models.

1. Volcano database

Table S1 is providing the database of the arc volcanoes considered in this study.

Table S1: Database containing the geographical locations and volume estimates of the analyzed arc volcanoes around the Pacific basin.

2. Comparison with other data

Figure S1 shows the comparison between the volcano volume density, d_V, and other data. This figure is similar to the Figure 10 from the main paper. As two outliers dominate, we provide here this comparison without the two outliers: West Torres Plateau (WTP) and D'Entrecasteaux Ridge (DER). The data used to obtain this figure are provided in the table S2.

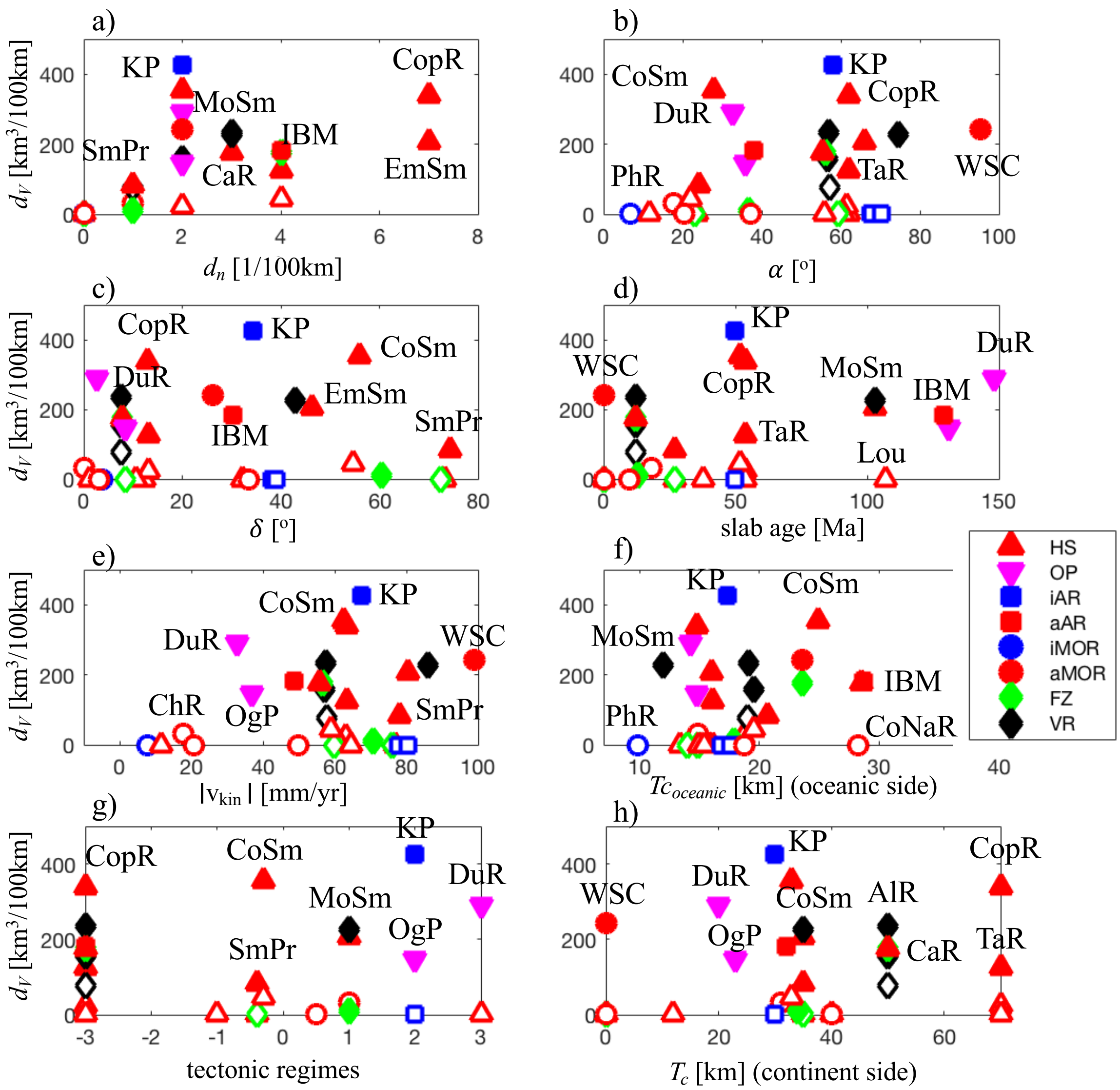

Figure S1: Comparison between d_V and d_n (a), and between d_V and other geophysical data (b-f): (b) α, the angle between the linear feature and the perpendicular to the trench; (c) δ, the slab dip, computed from Slab2 (Hayes et al., 2018); (d) the slab age (data from Hughes and Mahood, 2011); (e) the norm of the difference between the kinematic velocity of the subducting plate and the kinematic velocity of the overriding plate, $|v_{kin}|$ (calculated with the UNAVCO Plate Motion Calculator using GRSM 2.1 model, Kreemer et al., 2014); (f) the crustal thickness along the subducting feature, $Tc_{oceanic}$ (data from Pasyanos et al., 2014); (g) the tectonic regimes in the upper plate: compression (-3 to -1, magnitude connotes intensity), neutral or transverse (0), tension (1 to 2) or back-arc spreading (3) (data from Hugues and Mahood, 2015); (h) crustal thickness of the upper plate (data from Hugues and Mahood, 2015). The symbol shape and color indicates the feature origin (see legend): hotspots (HS), oceanic plateaus (OP), volcanic ridges (VR), active mid-oceanic ridges (aMOR), inactive mid-oceanic ridges (iMOR), active arc ridges (aAR), inactive arc ridges (iAR), and fracture zones or transform faults (FZ). This figure is similar to the Figure 10 from the main paper. The difference is that we have removed two outliers: West Torres Plateau (WTP) and D'Entrecasteaux Ridge (DER).

Table S2: Feature name, acronym, type, subducting plate, upper plate, east (v_x) and north (v_y) components of the difference between the kinematic velocity of the subducting plate and the kinematic velocity of the overriding plate, $|v_{kin}|$ (computed with the UNAVCO Plate Motion Calculator using GRSM 2.1 model, Kreemer et al., 2014); slab age (data from Hughes and Mahood, 2011); crustal thickness along the subducting feature, T_c^{oc} (data from Pasyanos et al., 2014); crustal thickness of the upper plate, T_c^{cont} (data from Hugues and Mahood, 2015); stress code indicating the tectonic regime in the upper plate: compression (-3 to -1, magnitude connotes intensity), neutral or transverse (0), tension (1 to 2) or back-arc spreading (3) (data from Hugues and Mahood, 2015). The type of each feature reads as follows: hotspot (HS), oceanic plateau (OP), inactive arc ridge (iAR), active arc ridge (aAR), inactive mid-oceanic ridge (iMOR), active mid-oceanic ridge (aMOR), fracture zone (FZ), volcanic ridge (VR).

References

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