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# Boron and B-Sr-Nd isotopes as tracers of FME and volatile enrichments in the mantle source of Kamchatka arc basalts.

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The voluminous magmatic outputs from the old, cold and altered Pacific slab under the Kamchatka Peninsula creates an ideal environment to utilise B and B isotopes to faithfully trace volatile release across subduction zones. Here we report new petrological and geochemical results (XRF, EMPA, SEM, MC-ICP-MS, TIMS and SIMS) from the forearc-situated Kozelsky and Avachinsky volcanoes. The sampled olivine-phyric basaltic suites record high MgO (5-15 wt%), Ni (15-250 ppm) and Cr (60-800 ppm) abundances. The whole rock $^{87/86}$Sr and $^{143/144}$Nd ratios of these volcanoes show narrow ranges (~0.70335 and ~0.51305, respectively), revealing dominantly mantle wedge (non-crustal) magma sources. Such isotopic signatures are nearly identical to those of high-MgO basaltic lava and tephra from the Tolbachik monogenetic field in the Central Kamchatka Depression (the second volcanic belt with slab depths of ~200km) [1, 2, 3]. We are now focussing on the analysis of $\delta^{11}$B and hydrous contributions ($H_2O$, B, and halogen concentrations) in melt inclusions, to further trace the non-crustal, boron-depleted and isotopically light arc mantle background across the Kamchatka arc. Kozelsky magmas sample very shallow depths to slab of less than 90km [4] and those are expected to reveal serpentinite/melange-influenced outputs [e.g. high B and heavy $\delta^{11}$B], in contrast to AOC (altered oceanic crust) melt dominating mantle metasomatism in the arc belts with deeper subducting slabs (i.e. Tolbachik [1, 2, 3]). Our results will evaluate if systematic variations in B-Sr-Nd isotopes and trace element ratios can be linked to across arc change in depth to slab of the magma source and/or reveal details about the prevailing geodynamic regime.

*References:*

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