Diverse hydrothermal fluid chemistries at 12–15°N, Mid-Atlantic Ridge: *Irinovskoe*, *Semenov-2*, *Azhadze II* and *Logatchev 1*

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Most known/suspected seafloor hot springs (*ca*. 700+) likely interact with mainly basaltic or felsic oceanic crust [1]. Despite the significance of hydrothermal interactions with ultramafic substrate for astrobiology/prebiotic chemistry and global geochemical cycling, comprehensive fluid chemistries are available for very few such vent systems (<10), obscuring potential diversity or commonality. Here, we present detailed fluid chemistry and isotope ($^{87}Sr/^{86}Sr$, $\delta^{13}C$) data from the novel ultramafic-hosted *Irinovskoe* (2790m depth) and *Semenov-2* (2440m depth) vent fields (13°20'N and 13°30'N oceanic-core complexes, respectively [2]), sampled together with vent fluids from *Azhadze II* and *Logatchev 1* [3] on the 12–15°N segment using isobaric gas-tight samplers in 2016.

Both *Irinovskoe* black smokers (356–359°C) and near-clear *Semenov-2* fluids (311–313°C, mainly from fragile anhydrite chimneys) vent directly from corrugated surfaces, with compositions reflecting a single source fluid to vents at each site. Salinities are similar to seawater at *Semenov-2* and *Logatchev 1*, but higher at *Irinovskoe* and lower at *Azhadze II*, with an overall $pH_{25°C}$ range of 4.0 to 4.9. Endmember B concentrations in all fluids (200–295µmol/kg) are depleted relative to bottom seawater (413µmol/kg), implying substantial B uptake during olivine serpentinization. H_2/CH_4 ratios, however, vary dramatically between all 12–15°N vents (from 1.7 to 31), with H_2 far less abundant at *Irinovskoe* and *Semenov-2* than at *Azhadze II* or *Logatchev 1*. Abundant (mmolar) dissolved CH_4 at *Semenov-2* and *Logatchev 1* is *ca*. 5x that of *Irinovskoe* or *Azhadze II*. These data thus not only broaden known ultramafic-hosted vent fluid compositions, but highlight the potential for biogeochemical diversity within a single ~120 nm slow-spreading ridge segment.

[1] Beaulieu & Szafranski (2018) *InterRidge Global Database* (http://vents-data.interridge.org) [2] Escartín et al. (2017) *G-Cubed*, 18, 2016GC006775. [3] Charlou et al.(2010), *AGU Geophysical Monograph Series,* vol. 188