

## Spherule layers in the Paleoproterozoic Zaonega Formation, Karelia: new data from drill-core OnZap1

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Organic-rich sedimentary rocks of the Zaonega Fm, Onega basin, Karelia, Russia with depositional age between  $1975.3 \pm 2.8$  and  $1967.6 \pm 3.5$  Ma (Martin et al., 2015) contain spherules (spherical aggregates) typically associating with dolostone breccias. The spherules were first discovered in three intervals in drill-core 13A and some in 12A of the FAR-DEEP Project and it was proposed that they are of meteorite impact origin (Huber et al. 2014). In 2012 three additional cores were drilled in the Zaonega Fm and similar spherules were discovered in core OnZap1. In this contribution we present the new results on the distribution, morphology, mineralogy and geochemistry of spherules in OnZap1. We interpret the brecciated sedimentary beds containing the spherules in 13A, 12A and OnZap1 drill-cores as representing one event rather than several and suggest new correlations. Different from other Precambrian spherules, the ones found in Zaonega Fm consist mainly of secondary mica/clay (phlogopite) and calcite with minor apatite, pyrite and quartz reflecting variable diagenetic and/or hydrothermal replacement and recrystallization paths. It is important to note that the new age constraints on the deposition of the Zaonega sediments suggest an undiscovered large impact happened in this time period.

### References:

- Huber, M.S. et.al., 2014. Impact Spherules from Karelia, Russia: Possible Ejecta from the 2.02 Ga Vredefort Impact Event. *Geology* 42: 375–378
- Martin, A.P. et.al., 2015. Multiple Paleoproterozoic Carbon Burial Episodes and Excursions. *Earth and Planetary Science Letters* 424, 226–236