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Laboratory Scale Simulating of Spiral Plumes in the Mantle ALBERT SHARIFULIN, Perm National Research Polytechnic University, ANATOLY POLUDNITSIN, Perm National Research University — On the basis of laboratory simulation a mechanism is established for the formation of the mantle convection spiral plumes from a core hot point in the presence of a roll-type large-scale convective flow. Experiment are close to fulfilling Golitsin's requirements [1] to laboratory models of mantle convection. We experimentally simulated the appearance of a plume from the local heat source generated by beam of green laser and study its interaction with cellular flow, simulating beneath the plates shear flow. It is shown that the presence of convective motion may lead to the formation of a strange spiral convective plume. Experimentally showed that the presence of cellular convective motion (simulating the large-scale shear flow exists beneath the plates) the plume from a point source of heat (core hot point) can acquire a spiral shape with horizontal sections needed to launch the mechanism of formation of chains of volcanic islands [2]. It is shown that possible existence of spiral plumes in mantle can help to interpret of last decade mantle tomography results.

[1] Golitsin GS (1979) Simple theoretical and experimental study of convection with some geophysical applications and analogies. *J Fluid Mech* 95: 567.

[2] Skilbeck, JN, Whitehead JA (1978) Formation of discrete islands in linear chains. *Nature* 272: 499.

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