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On formal classification of volcanic eruption types and regimes based on the similarity theory

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Application of the similarity theory principles and dimensional analysis, supplemented by some original approaches, suggests the way to achieve following goals which are significant for understanding and modelling of the volcanic process.

1. To introduce and to define more exactly the formal classification of volcanic eruption types in the same way as it is done for the flow regimes in terms of dimensionless numbers in fluid mechanics.
2. To avoid the necessity of knowing the exact values of physical parameters which are hard or even impossible to measure (viscosity, the conduit size etc.) in modelling the volcanic processes. Instead the few number of nondimensional similarity criteria, specific to volcanology, is suggested to be used. The quantities of similarity criteria could be estimated according to observable qualitative characteristics of the process regime to be modelled.
3. To bring the variety of existing mathematical and physical models of volcanic eruptions to a uniform system. It allows to compare different models and, mostly important, to outline their applicability limits.

Biography

Sergey Samoylenko has completed his PhD from Yeungnam University (South Korea). He is the senior researcher at Institute of Volcanology and Seismology FEB RAS, Kamchatka, Russia, studying the active volcanism and the dynamics of volcanic eruption. He has published more than 10 papers in reputed journals and has been serving as an Editorial Board Member of reputed.

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