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eEarth Discuss., 1, 81-96, 2006

[www.electronic-earth-discuss.net/1/81/2006/](http://www.electronic-earth-discuss.net/1/81/2006/)

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## Fall-experiments on Merapi basaltic andesite and constraints on the generation of pyroclastic surges

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**Abstract.** We have performed fall-experiments with basaltic andesite rock samples from Merapi volcano, using an apparatus designed to analyze samples heated up to 850°C. Relative pressure changes during impact and fragmentation of the samples were measured by a pressure transducer. From 200°C, dynamic pressure waves were formed on impact and fragmentation. Peak and duration of the pressure signal, and degree of fragmentation were found to strongly increase with increasing temperature of rock samples. The pressure waves are most likely generated by sudden heating of air forcing it to expand. We propose that the observed pressure changes are analogues to pyroclastic surges that may be generated on impact and fragmentation of large blocks during passage of a pyroclastic flow over a steep cliff. We infer that rock temperatures of ca. 400°C are sufficient for this process to occur, a temperature common in pyroclastic flows even in distal reaches.

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Citation: Schwarzkopf, L. M., Spieler, O., Scheu, B., and Dingwell, D. B.: Fall-experiments on Merapi basaltic andesite and constraints on the generation of pyroclastic surges, eEarth Discuss., 1, 81-96, 2006. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)

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