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Comment

Interactive comment on “Energy of plate tectonics calculation and projection” by N. H. Swedan

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The author states that "An amount of magma is produced following mantle decompression and it is admitted into a magma chamber. Equal amount of magma is consumed at midocean ridges. A large magma chamber having a large residence time acts as a bladder whose volume does not vary substantially with small variations of magma flow rate. As a result, the pressure in the magma system can be assumed to remain steady at any elevation. This provides steady and sustained pressure that drives the tectonic plates. Please see lines 15-25 of page 140 of the manuscript."

The author requires empirical evidence that the magma chamber will behave as a bladder, instead of displacing in response to pressure as would normally be assumed. This should at least be evident in faulting morphology and focal mechanisms about ridge axes which, in apparent contradiction to the author's conjectures, are known

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to be consistent with an extensional regime. The author states (pg. 146; and in a response to reviewer 2) that incompressibility of the mantle justifies the assumption that pressure will not be relieved. This is erroneous. Although it is an ultimately incorrect simplifying assumption, incompressibility only assumes that the density of a material will not change in response to stress, not that it will not displace.

Interactive comment on Solid Earth Discuss., 5, 135, 2013.

SED

5, C204–C205, 2013

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