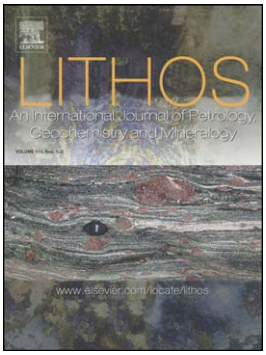

New insights into the origin of ladder dikes: implications for punctuated growth and crystal accumulation in the Cathedral Peak granodiorite

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PII: S0024-4937(16)30303-6
DOI: doi:10.1016/j.lithos.2016.09.015
Reference: LITHOS 4076

To appear in: *LITHOS*

Received date: 25 January 2016
Revised date: 8 September 2016
Accepted date: 10 September 2016

Please cite this article as: Wiebe, R.A., Jellinek, A.M., Hodge, K.F., New insights into the origin of ladder dikes: implications for punctuated growth and crystal accumulation in the Cathedral Peak granodiorite, *LITHOS* (2016), doi:10.1016/j.lithos.2016.09.015

New insights into the origin of ladder dikes: implications for punctuated growth and crystal accumulation in the Cathedral Peak granodiorite

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Abstract

Ladder dikes are steep tabular bodies, typically a meter or less thick, composed of moderately dipping, concave upward, alternating dark (i.e. schlieren) and light bands oriented roughly perpendicular to the ladder dike margins. These structures occur widely but sparsely in granitic rocks and are found prominently in the Cathedral Peak granodiorite (CPG) of the Tuolumne Intrusive suite. Previous studies have interpreted that ladder dikes form as a result of processes including the downward flow of crystal mush in cracks within strong crystal mush or by upward flow in steep tubes that migrate within a strong crystal mush. Our new observations indicate that ladder dikes formed by downward flow of crystal mush in troughs or valleys, in a manner potentially comparable