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新疆北山地区二叠纪地壳伸展量估算: 基性岩墙群厚度统计的结果

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摘要:

新疆北山地区广泛发育晚古生代侵入岩和基性岩墙群. 本文利用多源高分辨率卫星遥感影像(ETM+, SPOT, CORONA KH4B, Geoeye 1, Quickbird2)在该区约26880km²范围定量提取基性岩墙1375条. 基性岩墙侵入石炭、二叠系火山岩、侵入岩、沉积岩和前寒武纪变质岩. 岩墙单体长250m至34km, 平均长度5km, 厚度从1m至31m, 平均厚度7.9m, 岩墙长度和厚度均呈负指数分布. 约70%的岩墙呈NNW-NE方向展布. 受NEE向走滑断层影响, 在断裂带附近岩墙发生强烈扭曲. 从北到南垂直岩墙的主要走向, 取3条剖面, 分段统计岩墙的厚度并计算伸展量. 结果表明: 该区二叠纪地壳伸展量为0.59%~2.01%, 自南向北伸展率逐渐减小, 在侵入岩体伸展量高达8.32%, 沉积岩/变质岩区的伸展量为0.05%~0.3%. 该区二叠纪基性岩墙发育与侵入岩体有密切的时空关系并受断裂控制和改造.

英文摘要:

The geology of Beishan area in Xinjiang, Northwest China is characterized by numerous Late Paleozoic intrusive rocks, and widespread mafic dyke swarms, which indicate continental lithospheric extensional events. This work focused on using multisource high-resolution remote sensing images (ETM+, SPOT, CORONA KH4B, Geoeye1 and Quickbird 2) to extract the geometric features of mafic dykes and estimate the Permian crustal extension of this area. 1375 dykes were extracted from the area about 26880km². The spatial distribution of the dyke density and crustal extension are obtained based on the statistics of 1375 extracted mafic dykes. The results show that NNW-NNE-trending dykes dominate. The length and thickness distributions of dykes follow statistical laws with negative exponent. The maximum length of individual dyke is about 34km, the mean length is about 5km, and the maximum and mean dyke thicknesses are 31m and 7.9m, respectively. The crustal extension of the area ranges from 0.59% to 2.01%. From south to north, the dilation decreases gradually. The crustal extension in the intrusive rock is as high as 8.32%. In sedimentary and metamorphic rock areas, the crustal extension only ranges from 0.05%~0.3%. The Permian mafic dyke swarms have a close spatial relationship with intrusive rocks, meanwhile, are controlled and transformed by regional faults.

关键词: [基性岩墙群](#) [伸展量](#) [遥感](#) [北山](#) [新疆](#)

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