Three granite levels in the collisional continental crust (Phanerozoic and Proterozoic examples)

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Granite melt generation resulted from overheating of the thickened crust and following high grade metamorphism appears to be the main petrologic mark of continental collision.

The uppermost granite level is presented by small granite plutons such as the Mo-W ore bearing Pliocene Tyrnauz granite in the Caucasus collision, intruded into the higher fold complex at 2000 m above sea level. It came from 15% melting at T=1000 ^{0}C, P= 8-9 kbar of average andesite crust of the Mesozoic island arcs of the underthrusted Trans-Caucasian plate

On the middle level, recent granite melt layer of 10 km thick at 10-15 km depth is presumed from geophysical data(Himalayas , Caucasus) to be accumulated probably at density equilibrium with surrounding rocks. If subduction stops, the uppermost fold complex is washed away and that layer comes up to the earth surface to form the upper horizon of the continental crust. The deep eroded Western Baikal Paleozoic collision system demonstrates this upper crust to be composed of granite-gneiss dome structures with ore bearing pegmatites.

The lowermost level is presumed to be a place of granite melt out resulted from overheating of the thickened crust, localized along shear zones. In the Siberian craton granites bearing veined base metals mineralization were melted out in collisional shear zones at 1.9-1.8 Ga and accompanied with granulite grade impression on the large ancient terranes nearby, both to be on the same deep level of the collisional thickened crust.

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