



## **Metamorphic field gradients - the best petrological evidence for overpressure we can get ?**

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Petrologists have repeatedly attempted to document tectonic overpressure using geobarometric methods on metamorphic parageneses. All such attempts have failed or have been inconclusive at best. This may be either due to the short livedness of pressure fluctuations, or due to the scale at which the problem is studied. On the other hand there are observations on pressure variations along metamorphic field gradients that may easily be explained by drawing upon non-lithostatic pressure variations, but are difficult to interpret within the regional concepts usually applied to them. In particular we refer to metamorphic field gradients where pressure varies much more than temperature - if compared to normal geothermal gradients. Such gradients occur commonly in many terrains around the world. Without appealing to tectonic overpressure it is often difficult to account for this observation because it invariably requires the input of heat at shallow crustal levels, while leaving deep levels undisturbed. One particularly nice example is given by the field gradient in the eclogite type locality in the Koralpe of the eastern Alps. There, the region of highest metamorphic grade was metamorphosed at 700C and 15 kbar. From there pressure drops over 50 km down to 6 kbar, while temperature remains above 600C. This contributions discussed possible causes of this gradient in terms of non-lithostatic contributions to pressure and/or temperature via shear heating.