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P,T = *f*(*t*): geothermobarometry of eclogites as a function of time, or the phenomenon of increasing pressures over the years

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Due to their geodynamic significance, geothermobarometry of eclogites always played an important role in deciphering the metamorphic evolution of paleosubduction zones. Geothermobarometric investigations of eclogites have evolved over the years from using simple phase equilibria to contrain the metamorphic peak *P-T* conditions to complex calculations utilising phase equilibria or thermodynamically stable mineral assemblages involving internally-consistent databases. One characteristic feature occurred over the years: while in the beginning limiting pressure estimates could only be obtained, calculations of the actual pressures using a multitude of phases and reactions yielded oftentimes increasing pressure estimates over the years.

A very characteristic example is the Texel Complex: initially (1991) limiting pressures of 1.1 to 1.2 GPa were obtained using the breakdown of albite to jadeite + quartz. Then (2006) pressures (although again only limiting) increased to 1.2 to 1.4 GPa in order to increase (2008) to *P-T* conditions of 1.8-2.2 GPa and 560-600°C. These calculations involved the mineral assemblages garnet + omphacite + epidote + quartz and garnet + omphacite + Na-Ca amphibole + epidote + quartz. In 2013 the *P-T* conditions of eclogites from the Texel Complex climbed to 2.65-2.90 GPa and 630-690°C by using the garnet-phengite-clinopyroxene barometer.

The aim of this presentation is not to verify or falsify existing *P-T* data but to document the evolution of geothermobarometry in eclogites by briefly illustrating its different methods („classical“ geothermobarometry, multi-equilibrium geothermometry and pseudosection geothermobarometry) and caveats such as the influence of *a-X* relations and $a H_2O$ on the results.