

**ELECTRON BACKSCATTERED DIFFRACTION STUDIES ON OMPHACITE  
FROM THE ECLOGITE ZONE OF THE TAUERN WINDOW, AUSTRIA:  
IMPLICATIONS FOR THE EXHUMATION OF ECLOGITES  
IN EXTRUSION WEDGES**

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The question how extremely dense eclogites are exhumed in orogens remains a lively debated controversy in tectonics. A widely held opinion is that buoyancy is the main driving mechanism and that buoyancy forces lead to the formation of a so-called extrusion wedge, which is bounded by a lower thrust and an upper normal fault. We have tested this hypothesis by studying the deeply exhumed Eclogite Zone in the Tauern Window of the Austrian Alps. The Eclogite Zone is part of the Pennine nappe edifice of the Tauern Window and is sandwiched between metasedimentary rocks of the Venediger nappe below and ophiolitic rocks of the Glockner nappe above. While maximum pressures in the Venediger and Glockner nappes were 10 – 12 kbar, the Eclogite Zone was subjected to distinctly higher pressures of 20 - 25 kbar. Because the Eclogite Zone is bounded by lower pressure units on both sides it has been proposed that it was exhumed in an extrusion wedge, i.e. it should be bounded by a top-N thrust below and a top-S normal fault above. The validity of this assumption can be tested because the high-pressure textures should have different asymmetries in a profile across the Eclogite Zone. Our approach was to use Electron Backscattered Diffraction measurements on omphacite along N-S profiles across the Eclogite Zone to resolve any systematic differences in the pattern of their crystallographic preferred orientation (CPO). Omphacite shows strong CPO patterns with distinct asymmetries. The sense of asymmetry of the CPO patterns consistently yielded a top-N sense shear and does not change in any systematic fashion. This finding does not support an extrusion wedge interpretation of the Eclogite Zone. Field work shows greenschist/blueschistfacies top-N thrusting at the base of the Eclogite Zone and greenschist/blueschistfacies sinistral strike-slip faulting at the top of the Eclogite Zone. The omphacite CPO patterns together with deformation/metamorphism relationship from the basal thrust zone show that the top-N thrust operated from 80 km up to mid crustal levels. However, the omphacite CPO's at the top of the Eclogite Zone do not show any geometric relationship to the sinistral strike-slip fault. This makes any interpretations as to how the exhumation of the Eclogite Zone was structurally accomplished difficult.