Geophysical Research Abstracts, Vol. 8, 08661, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08661

Structural correlation across the Nevado-Filabride Complex, Betic Cordillera, using inclusion-trails as reference elements

D. Aerden, J Galindo Zaldivar, M. Badri

Departamento de Geodinámica, Universidad de Granada, Spain (aerden@ugr.es)

The tectono-metamorphic history of the Nevado-Filabride tectonic window in the Betic Cordillera has been generally considered to comprise a first stage of orogenic build-up leading associated with high-pressure metamorphism, followed by crustal extension, orogenic collapse and retrogression during the Miocene. Kinematic reconstructions of both stages have relied on the recognition of two main tectonic foliations (S1 and S2). S1 is preserved in microlithons and as inclusion trails in garnet porphyroblasts, whereas S2 extensively transposes S1 and forms the main regional cleavage . Later sets of weaker crenulation cleavages overprint both fabrics. A preliminary study of the 3-D internal structure of inclusion trails in garnet porphyroblast from 14 samples reveals the composite nature of "S1" and indicates a more complex pre-S2 deformation history as assumed so far. Inclusion trails are found to exhibit vertical and horizontal preferred orientations similar as in other orogens where inclusion trail orientation data have been collected systematically (e.g. Aerden 2004). Inclusion trails in the 14 analyzed samples from the Nevado-Filabride Complex can be grouped in two age sets which occur mixed in individual samples. Both sets are associated with distinctive preferred strike directions. Older inclusion trails have NS to NE-SW strikes, where younger inclusion trails exhibit a strong WNW-ESE maximum. This data suggests that the orogen was affected by cyclic gravitational collapse during continuous plate convergence. Furthermore, a change in crustal shortening direction could be recorded by the switch in inclusion trail trend, although analysis of more samples from additional locations is required to test this hypothesis. The orientational consistency of the inclusion trails allows them to be used as reference structures at the time of correlating different structural successions that can be recognized macroscopically at different locations. Based on this approach and on new field data, a refined

correlation of structural sequences recognized previously in eastern and western sectors of the Nevado-Filabride is presented. It is shown that previous correlations have been occasionally misled by the heterogeneous development and field appearance of successive fabrics in the study area.