Geochemistry of peridotites and vein rocks from the Lizard Complex, SW England:
Clues to their metamorphic, geochemical and tectonic evolution

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Tectonic slices of mantle peridotites associated with upper crustal mafic rocks that occur as thrust bound units obducted onto continental crust, are commonly regarded as ophiolites, which represent relict fragments of oceanic lithosphere (e.g. Coleman, 1977). However, it is now well established that mantle peridotites may also be exhumed to shallow structural levels during extension accompanying lithospheric thinning (Bolliot *et al*. 1987). In the latter case, the peridotites are often considered to represent subcontinental mantle, and the process of exhumation being accommodated by displacement along a detachment zone in response to asymmetric lithospheric extension at an active continental or non-volcanic rifted margin. Continued extension can result in continental break-up and the opening of a rift basin and may even progress to the opening of an oceanic basin. Present-day examples of peridotites, which are interpreted to represent tectonically exhumed mantle in continental to incipient oceanic rift environments, include Zabargad Island, Red Sea (Piccardo *et al.* 1993) and the Galicia margin (Bolliot *et al*. 1987).

Subcontinental mantle peridotites and peridotites exhumed during lithospheric extension at active continental or non-volcanic rifted margins typically display relatively undepleted primary compositions, thus implying limited partial melting. In many peridotites deformed in shear-zones during exhumation, there is evidence for selective chemical enrichment in response to the infiltration of melts and/or mantle fluids e.g. Zarbargad Island (Agrinier *et al*. 1993; Piccardo *et al.* 1993).

In this poster, we present new petrographic, major and trace element bulk rock geochemical data, and mineral geochemical data for peridotites and associated vein rocks from the Lizard Complex of SW England. Their primary geochemical compositions suggest that the Lizard Complex was developed at a non-volcanic rifted margin. The subsequent metamorphic and geochemical evolution of the peridotites has been investigated and yields evidence for mantle-melt infiltration with MORB magma during exhumation of mantle through lithospheric extension and rifting.