HR: 0800h

AN: **T21C-0502** **[Abstracts]**

TI: **Lithospheric-scale plate boundary response to changes in plate motion**

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AB: Although global plate motions have been relatively constant over the past 10Myr, on a regional scale there are significant changes in plate motion directions that must be accommodated by the plate boundary. At shallow and middle crustal levels, where the brittle regime dominates, these plate motion changes are accommodated through strain partitioning along preexisting weaknesses (faults) and/or through the development of transtensional/transpressional regimes with crustal thinning/thickening or the reactivations. Throughout the rest of the lithosphere, where ductile deformation dominates, how the plate boundary adjusts to the change is still not completely clear. For example, in a similar manner to the behavior of the crust, the ductilely deforming lithosphere may thicken along the preexisting shear zones. Or the plate boundary may develop a new shear zone that is oriented along the new direction of shear. Here we analyze the case of South Island New Zealand, a region with a significant change of the plate motion direction since 20 Ma and well constraint plate kinematics. Since ~6-12 Ma the change of the motion between Pacific and Australian plates, as well as the southern migration of the Hikurangi subduction, changed conditions along the Alpine fault from almost pure strike slip to significant transpression. On a crustal scale this compression has been accommodated by crustal thickening and the creation of the Southern Alps. To determine how this change of plate motions is accommodated on the lithospheric scale we use a FEM code to study how the ductile lithosphere will respond to changes of the boundary conditions. In this way we can differentiate among the possible deformational behaviors and determine the nature of coupling between the upper crust and Lithospheric mantle and the influence of the Alpine fault on the deformation on a lithospheric scale.

DE: 1209 Tectonic deformation (6924)

DE: 1236 Rheology of the lithosphere and mantle (7218, 8160)

DE: 8120 Dynamics of lithosphere and mantle: general (1213)

DE: 8150 Plate boundary: general (3040)

DE: 8162 Rheology: mantle (8033)

SC: Tectonophysics [T]

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