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Magmatic history of the Fitz Roy Plutonic Complex, Southern Patagonia (Argentina)

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The Fitz Roy Plutonic Complex (FRPC) belongs to a chain of isolated Miocene plutons in Southern Patagonia, which are located in an exotic position between the volcanic arc and the Patagonian plateau basalts. It has been suggested that the intrusion of these plutons is related to the subduction of the Chile ridge. However, the FRPC is not well studied (Kosmal 1997). Here, we present first results based on field observations and petrography and speculate about the magmatic evolution of the FRCP.

The FRPC is formed by at least five rock types: a main central *granitoid* body (granitic to tonalitic), which is partially surrounded by a *tonalite*; further a *diorite*, a *hornblende gabbro* and an *olivine gabbro*.

Both the granitoid and the tonalite show fresh magmatic mineralogy and textures. The central *granitoid* has abundant schlieren structures and is locally rich in miarolitic cavities. Its contacts with the host rock and other plutonic bodies are sharp and everywhere steep. The *tonalite* shows large variability in textures (grain size, flow textures) related to the distance to the *hornblende gabbro.* Its contact with this gabbro is sharp and undulating. The contact to the *olivine gabbro*, in contrast, is marked by a brecciated zone with meter-sized angular gabbroic blocks in a tonalitic matrix.

Ductile deformation at macro and microscopic scale are widespread in the *hornblende gabbro* and the *diorite.* The *hornblende gabbro* is strongly deformed. Locally, a penetrative foliation with metamorphic (?) mineralogy (amph, bt, fsp, qz) was found, indicating a deformation under at least upper greenschist facies conditions. The *diorite* shows abundant low temperature hydrothermal alteration (chl, ep, qtz, ser). The

contact between diorite and host rock is characterized by mylonites – in places with garnet porphyroblasts.

Based on our field observations and petrographic criteria we propose that the FRPC was formed by at least two magmatic cycles. An older diorite-gabbro phase, and a younger granitoid-tonalite phase, which is largely unaffected by post-intrusive deformation, metamorphism and/or hydrothermal overprinting. The granitoid textures and its sharp contacts clearly demonstrate that it intruded after cooling and deformation of the older (?) mafic suite. We speculate that there might have been a (significant) time gap in time between the two magmatic cycles. However, at present the age of the FRPC is determined only by a single K-Ar whole rock (granite) date of 18 Ma (Nullo et al., 1978). New age determinations are in progress to verify our observations and will be discussed.

Nullo, F., Proserpio, C., Ramos, V. A. & Rabassa, J. (1978): VII Congr. Geol. Arg., T.I, 455-470.

Kosmal, A. (1997): Trabajo final de licenciatura. Departamento de Geología, U. de Buenos Aires.