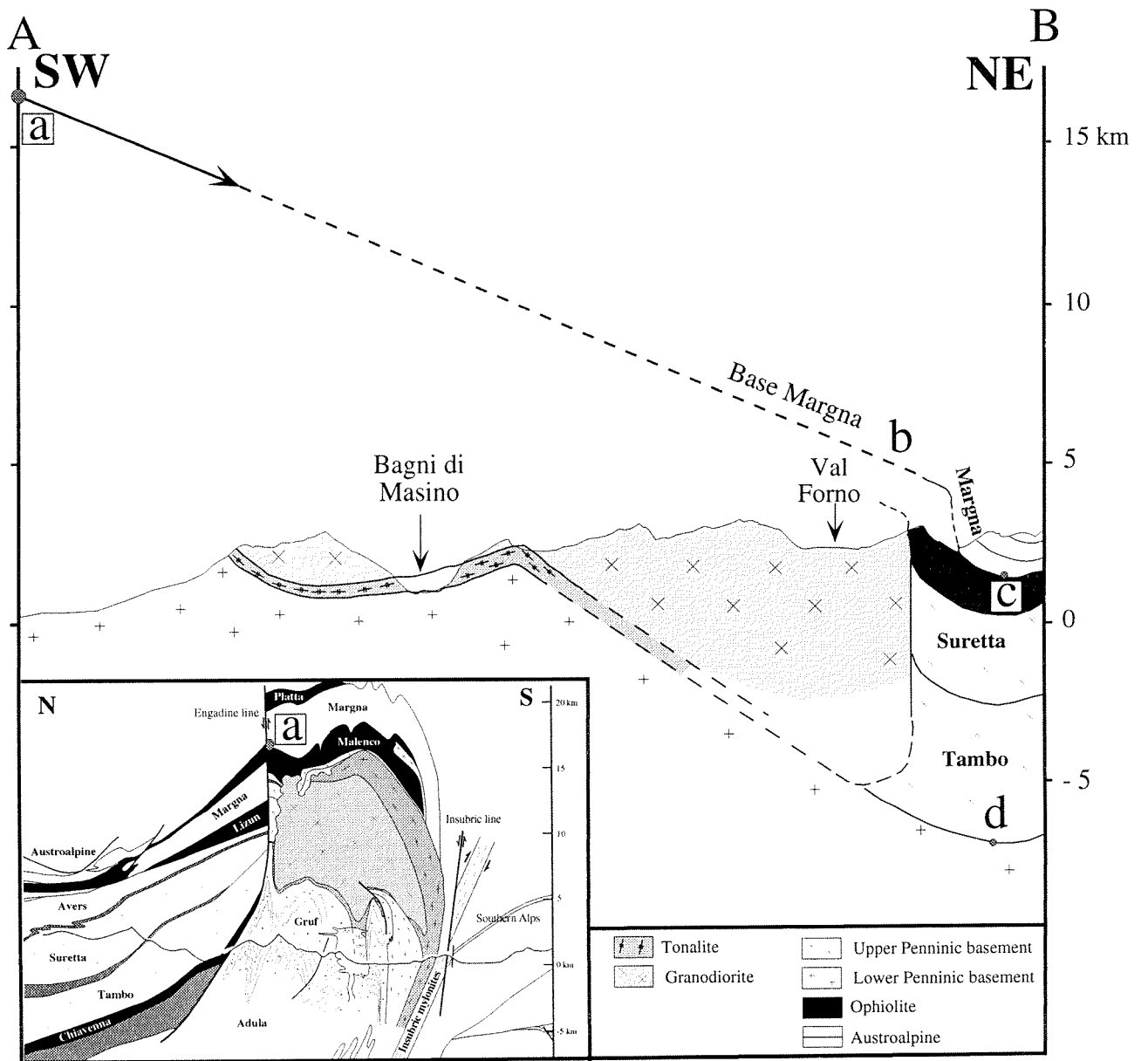


Fig. A



Appendix A: Construction of profile C-D

The western end of the profile begins at Swiss coordinate 755, connecting with the N-S cross section constructed by Schmid et al. (in press) (Fig. 2, small inset in Fig. A). In the west the profile follows the hinge line of a major antiform, which was constructed from structure contour maps of the tonalite/Gruf and tonalite/granodiorite contact. In the N-S profile the location of the nappe boundaries in the block North of the Engadine line and the known offset at this tectonic line (Schmid & Froitzheim, 1993) have been used in order to construct the location of the base of the Margna nappe south of the Engadine line. From this construction, the base of the Margna nappe (point a in Fig. A) as a flat east dipping nappe is at 16.6 km above sea level along coordinate 755 south of the Engadine line.

North of the Bergell intrusion the Tambo and Suretta nappes are shallowly east dipping and unaffected by Bergell related deformation. The average axial plunge, constructed from structure contour maps of Pfiffner et al. (1990) and from seismic modelling of Litak et al. (1993) is 22° to the East. The block south of the Engadine line experienced a $10,5^{\circ}$ rotation (clockwise north looking a NW-SE axis), because of the motion on the fault (Schmid & Froitzheim, 1993).

Therefore, this angle is added to the 22° east dipping plunge of the nappes. The resulting angle south of the Engadine line has been used in order to find the base of the Margna nappe at the eastern contact of the Bergell pluton. This construction brings the base of the Margna nappe approximately 2 km above the eastern margin of the Bergell pluton. Therefore the roof of the intrusion can be inferred to be minimum 0.5 km above the recent topography (subtracted 15 km thickness of the Forno unit from the base of the Margna nappe). Along the eastern contact of the Bergell pluton an intrusion related synform occurs, which brings the Forno unit in a steep position. We have no evidence for the exact geometry of the Margna- and Forno nappes above the recent topography.

In order to construct the base of the pluton in the East, the thicknesses of the Penninic

Tambo, Suretta and Forno nappes as measured in the N-S profile of Schmid et al. (in press) at the swiss-coordinate 150 have been added downwards from point c (Fig. A), where the base of the Margna nappe is flat lying and is not affected by the mentioned synform related to the intrusion. The result of this operation is point d, which defines the base of the Tambo nappe (Fig. A). We assume that the floor of the pluton follows the top of the Adula - Gruf unit, as observed in the west (Davidson & Rosenberg, submitted). Therefore, point d can be connected with the base of the intrusion in the middle part of the profile (near Bagni di Masino). Here, the floor of the intrusion is situated at the top of the Gruf-Adula unit (see Fig. 1; Davidson & Rosenberg, submitted), and the cross section can be directly constructed from geological and contour maps. The resulting average NE plunge of the base of the pluton is very similar to the constructed plunge for the base of the Margna nappe.

Additionally the magmatic pressures at the time of the solidus, derived from 'Al in hornblende' barometry (Schmidt, 1992) show a difference in crustal level between the Eastern and Western margin of the pluton. A hornblende-bearing granodiorite near Sella del Forno (Eastern margin), yields a pressure of 4.3 ± 0.2 kb. On the other hand, the pressures at the Western contact are around 6 - 6.5 kb (Reusser, 1987; Davidson & Rosenberg, in prep). This indicates a pressure difference of approximately 1.7 - 2.2 kb, which is equivalent to 6.3 - 8.1 km in depth. This is in good agreement with the geometrically derived differences between the base and the top of the intrusion. The profile shows that by combination of tilting and block rotation along the Engadine line the base and the top of the Bergell pluton are presently at a similar topographic level.

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