

**CONICAL FOLDS AND INTERFERENCE STRUCTURES:
INSIGHTS FROM THE COL BECHEI - SASS DAI BAC AREA
(NORTHERN DOLOMITES, EASTERN ALPS)**

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The Col Bechei – Sass dai Bac area, mainly covered by Jurassic thinly layered limestones, is essentially a kink country. Observed kink bands are often conjugate and are seen in places to split into higher-order ones, producing box fold patterns. In general the deeper lower-order kinks, appearing as reverse steeply dipping fractures, are rooted in the thicker Dolomia Principale (Hauptdolomit) layers. The layering, folded by the kinks, shows rounded concentric conical geometries, their hinges often marked by fractures.

Such field observations, together with those of interlayer slickensides and en-echelon gashes patterns, suggest that buckling occurred with flexural slip. Moreover, although shear folding may have occurred, there is no direct evidence of disjunctive slip on single surfaces.

Two main sets of kink systems, striking E-W and NW-SE respectively, are observed in the area.

The NW-SE major kink considered here is that running along the SE slope of M. Pares, across the S. Antonio Pass, into Fanes Piccola, up and across the Limo Pass and likely further SEwards. The absolute coincidence of the orientation and shape of the first-order structures obtained in the Limo and in the S. Antonio valley subareas, suggest that the two sites are intimately connected.

The purpose of the present work is to unravel the geometric relations between such structures and the nearly EW-running La Stiga-Sass dai Bac low-order folds west of it and the equally EW-striking Piz da Limo-Col Bechei folds east of it.

In the Bechei subarea the most recurrent orientation of the poles to the layering plunges steeply SE, the rest of them, spreading on a girdle with a shallowly NNW-plunging axis. A pole distribution similar to the one above is observed in the southern Sass dai Bac exposure, the most recurrent orientation being the same but weaker and the girdle axis slightly more NW-oriented. A second girdle is additionally present, as in the Bechei subarea, in a very weak form, with a SW-plunging axis. In the major transversal kink zone the girdle with a NNW axis, particularly strong in both the Bechei and Sass dai Bac subareas, is completely absent. Two alternative great-circle distributions are evident, with ENE-WSW and NE-plunging axes.

The lower-order folded surfaces, representing the enveloping surfaces, in the Bechei subarea are astonishingly similar to the higher-order ones described in the Sass dai Bac subarea. In the latter subarea the lower-order poles are dispersed within a 70-degree open cone plunging steeply WSW, whereas in the Limo subarea a clear WNW-ESE dispersion girdle is apparent. In the whole area the lowest-order conical fold axes lie on a subvertical WNW-ESE plane, with the exception of some of them in the Limo subarea, which stay on a WNW-dipping plane.

Conical folds are the rule in the area. Observed mushroom-shaped structural patterns appear to be the result of complex 3D non-coaxial fold interference.

The ubiquitous strong subvertical undeformed cleavage striking NW-SE and crosscutting all structures together with the conical warping of

cumulative fold axes about a shallowly SE-plunging pole suggest that the maximum shortening of the last deformational phase had a NE-SW direction.

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