



Structural control on volcanism in NE Honshu, Japan

V. Acocella (1), T. Yoshida (2) and R. Yamada (2)

(1) Dip. Scienze Geologiche Roma Tre, Italy (acocella@uniroma3.it / Fax: 00390654888201),
(2) Graduate School of Science, Tohoku University, Sendai, Japan

The NE part of Honshu island (Japan) consists of a N-S trending portion of arc characterized by NE-SW oriented compression during Mio-Pliocene and E-W oriented compression during Quaternary. Volcanic activity reflects this variation in tectonic style, mainly consisting of the development of rhyolite calderas (Mio-Pliocene) and andesitic stratovolcanoes (Quaternary). Remote sensing and structural field analysis have been performed to better define the role of tectonic on volcanism in NE Honshu. Remote sensing data show that the alignment and shape of the volcanoes (calderas and stratovolcanoes) is mostly parallel to the maximum compression direction (from Miocene to Quaternary) and, subordinately, to the trend of the arc. Structural data show that, during Mio-Pliocene, N-S dextral faults were predominant in the arc; subordinate NE-SW faults were present and thrust faults were lacking. During Quaternary, conjugate strike-slip faults (ENE-WSW and ESE-WNW trending), N-S thrust faults and E-W normal faults are present in similar proportions. These data suggest that the Miocene-Pliocene tectonic setting was characterized by a slip partitioning, with prevalence of N-S dextral faults along the arc. The emplacement of magma associated with the collapse calderas possibly occurred along areas of localized extension due to the activity of the dextral faults. Conversely, the Quaternary tectonic setting is characterized by an orthogonal convergence; the emplacement of magma feeding the stratovolcanoes mostly occurs through the formation of localized extension, parallel to the compression direction. Despite this different tectonic setting, preliminary calculations of the extruded magma show similar values from Miocene to Quaternary, suggesting that the different tectonic setting controls the distribution of extruded magma, but not its amount.