Mafic tephra-filled volcanic neck (Yangpo diatreme) in the Miocene Janggi Basin, SE Korea, and its relevant structures

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During the early Miocene, dacitic and basaltic volcanisms associated with crustal extension were pervasive in SE Korea. As a result, Miocene mafic tephra-filled volcanic neck (diatreme) occurs in the Janggi basin. Basaltic tuff breccias, surrounded by dacitic rocks, are filled in the isolated funnel-shaped diatreme about 400m in diameter. The breccias, massive or crudely stratified, comprise poorly sorted mixture of mafic volcanic clasts and epiclasts with hydroclastically fragmented sideromelane shards within the matrix. The overall strata of the surrounding dacitics dip toward the diatreme. The bedding traces, thus, are delineated as nearly concentric circles parallel to the boundary of the diatreme, indicating vent-ward collapse of the strata. Basaltic dykes and intrusive breccias occur in the basin. The basaltic dykes approximately radially intruded in respect of the diatreme, indicating that the origin of dykes is intimately related with the formation of the diatreme. Mafic dykes also occur within the diatreme, indicating that mafic magma continuously intruded after the diatreme formation. Three intrusive breccias, caused by steam-driven explosion, are observed in vicinage of the diatreme. They comprise angular and poorly sorted lithic fragments of dacitic welded/vitric tuffs. Using slip data of minor faults, it is interpreted that WNW-ESE trending horizontal minimum stress was predominantly operated during the diatreme formation. The structures, mentioned above, are very different from the structures observed in other Miocene basins in Korea. It is, thus, concluded that the local stress due to volcanism is more important than the tectonic stress on crustal deformations in the study area.