Geometry and microstructure of en echelon quartz veins

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Dissolution-precipitation creep is an important crustal deformation mechanism. However, competitive and/or cooperative interactions with other mechanisms such as dislocation creep and fracturing is not clear. Since pressure fringes and mineral veins are products of an interaction between fracturing and dissolution-precipitation processes, an investigation of their formation may shed light on this uncertainty. The geometries of en echelon quartz veins developed in the Sambagawa metamorphic rocks at Wakayama City show wide variety. This geometrical variety can be related to difference in the nature and/or time sequence of processes including arrangements of fracturing, deformation and rotation of bridges between fractures, and the filling of fractures with quartz.