The fissure eruptions of Fuji Volcano, Japan, during the last 10,000 years

Akira Takada, Takahiro Yamamoto, Yoshihiro Ishizuka, Shun Nakano

Geological Survey of Japan, AIST, Japan

E-mail: a-takada@aist.go.jp

Fuji Volcano, 3776m high, Central Japan, is the largest basaltic volcano in Japan, and located at the plate boundary between the North American Plate and Eurasian Plate. The magma plumbing system develops in the Philippine Sea Plate subducting beneath the above two plates. This paper discuss the effect of the stress field beneath Fuji volcano using eruptive fissures. The fissure eruption sites are good indicators to know the local stress filed in and beneath the volcano as well as the regional stress one. The local stress makes the feedback system on magma supply system in the shallow crust. The evolution of distribution on fissure eruption sites of Fuji Volcano suggests the restriction of eruption sites, that is, producing the more compressive condition around its own magma plumbing system. The fissure eruption sites younger than Cal BC 10,000 are easy to recognize on outcrops or using trenching survey. GSJ determined the ages of fissure eruption sites using trenching survey with 14C ages (Takada et al., 2007; Ishizuka et al., 2007; Nakano et al., 2007, Suzuki et al., 2007; Kobayashi et al, 2007). Fissure eruptions occurred at various azimuths during the period of Cal BC 10,000-6,000. The volcano became active again after a low activity period during the period of Cal BC 6,000-3,600 to construct the recent edifice with flank eruptions of various azimuths during the period of BC 3,600-1,500 (Yamamoto et al., 2005). The eruption sites became restricted to the summit to cause explosive eruptions during the period of Cal BC 1,500-300. The last summit explosive eruption was followed only by flank eruptions on the restricted flanks during the last 2,300 years. The dominant trend of the eruptive fissures is generally NW-SE, which is concordant to the axis of the regional maximum horizontal compressive stress filed. The eastern flank, however, caused a lot of fissure eruptions during the period of Cal BC 300-1100 (Yamamoto et al., 2011). In addition to the easter flank, the frequency of flank eruption became high on the NW and SE flanks during the Cal AD 700-1100 (Takada et al., 2007). After the effusive Jogan 864-866 eruption at the restricted vent, the eruptive fissures shifted its trend to NS during Cal AD 900-1100 (Yamamoto et al.,2005; Takada et al., 2007). The existence of high-level magma head is supported by high-level fissure eruption site up to 3,500 m-high just beneath the summit crater. Some of the fissure eruptions may have been caused by drain back. A decrease in explosively has relation to continuous degassing at the summit during AD 700-1200. The volcanic activity became low during Cal AD 1200-1700 before the last Hoei explosive eruption.