Periodic open-system peralkaline active Nemrut Volcano vs. episodic neighoring subalkaline Süphan Volcano: Holocene tephra swarm triggered by seismic unrest and hydroclastic forcing

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Some 500 tephra layers making up ca. 20 % of the 220 m thick ICDP Paleovan drill core in Lake Van (Anatolia) range in age from prehistoric to ca 600 ka. Tephras are sourced in two large active neighboring (40 km) volcanic edifices at the W and N shores of the lake: 2948 m high Nemrut caldera volcano erupted dominantly peralkaline trachytic to rhyolitic tephras [1]. Periodicity is expressd by pyroclastic flows erupting at ca. 30-40 000 year interval associated with caldera subsidence [2], all reflecting open system fractionating magma reservoirs with relatively constant influx of mafic parent magmas. Nemrut and Süphan tephras show strong chemical and volcanological contrasts with common unequilibrated plutonic clots being characteristic of Süphan whose tephras typically occur as swarms in lake sediments. Tephras derived from 4058 m high evolved subalkaline Süphan volcano are practically absent during the past 200 ky, except for a short tephra swarm within a short time span of ca. 340 years between ca 12.7 and 13.1 ka [3]. This Holocene swarm is preceded by some 10 turbiditic graded layers each underlain by seismites. We postulate triggering of the dying Süphan system by (a) seismic activity, (b) basalt-rhyolite magma interaction and (c) magma-glacier external forcing. The latter is indicated by commonly poorly vesiculated Süphan tephra with contorted vesicles and relativly dense “pumice”. Magma reservoirs are believed to have been small. Episodic eruptions are based on release of rhyolitic melt and frequent magma mixing. The actual eruption triggering being largely external (seismic followed by hydroclastic interactions).

[1] Sumita & Schmincke (2013) *Bull Volcanol*, **75**, 714-747. [2] Sumita & Schmincke (2013) *J Volcanol Geotherm Res*, **253**, 15-34. [3] Schmincke & Sumita (2014) *J Volcanol Geotherm Res*, **285**, 195-213.