

HR: 0800h

AN: **T21A-1933** [Abstracts]

TI: [Geochemistry of Quaternary Olivine Basalts From the Lut Block, Eastern Iran](#)

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AB: Samples were collected from more than 40 small monogenetic Quaternary volcanic cones, identified using available geologic maps and satellite images, which are located along the four margins of the Lut Block in eastern Iran. The Lut Block is a ~900 km north-south by ~200 km east-west desert largely covered by Tertiary volcanic rocks, with granitoid plutonic bodies exposed in some areas. The complex regional tectonic evolution of the Lut Block microplate involves the closure of the Paleotethys ocean during collision with the Eurasian plate to the north, the closure of the Neotethys ocean during collision of the Arabian plate from the west, and ongoing subduction of the Indian oceanic plate from the south below the active Makran arc of large stratovolcanoes such as Bazman and Taftan. Several major north-south strike-slip fault systems occur along the western and eastern margins of this block, and they extend through the Makran arc to the south. The samples are mainly olivine (Fo = 63-86) basalts. Contents of MgO = 4.31 to 8.62 wt %, Ni = 35 to 180 ppm and Cr = 35 to 280 ppm indicate that some of the samples crystallized from relatively primitive mantle-derived magmas. Mantle peridotite and deep-crustal granulite xenoliths are present at one locality. In samples from small parasitic cones associated with the large Makran arc stratovolcanoes along the southern margin of the block, contents of TiO₂ range from 0.9 to 1.11 wt %. In contrast, the range of TiO₂ contents for samples associated with the strike-slip faults along the eastern and western margins of the Lut block to the north of the arc is significantly higher, from 1.88 to 2.65 wt %. Based on HFS elements (Nb/Y versus Zr/TiO₂), all samples from the western and eastern margins of the block are alkali basalts, while the samples from the south are subalkaline basalts. Other geotectonic chemical discrimination diagram, such as those based on Th-Hf-Nb or Th-Zr-Nb, indicate that the samples from the south are calc-alkaline basalts and those from the eastern and western margins of the block are within-plate alkali basalts. The ratios of La versus La/Nb and Ce/Pb versus Nb/U also reflect the different tectonic setting for these samples. Based on these preliminary results, Quaternary calc-alkaline volcanism along the southern margin of the Lut block is related to oceanic plate subduction, while the alkali

basalts along the eastern and western margins of the area form by melting of the asthenosphere unmodified by subducted components. Their parental magmas rose to the surface along the very deep strike-slip faults that border the block without significant interaction with the continental crust. Keywords: olivine basalts, Lut block, Iran, peridotite xenoliths, Makran arc

DE: 1065 Major and trace element geochemistry

DE: 3619 Magma genesis and partial melting (1037)

DE: 8415 Intra-plate processes (1033, 3615)

SC: Tectonophysics [T]

MN: 2008 Fall Meeting