and that considerable crustal mass is exported from the region fluvially. Thus, it is likely that the Three Rivers serve as significant spatially extensive sinks of mass at the Earth's surface. This inference has not been taken into consideration in geodynamic models to date. Under these conditions, eastward movement of the thick crust of Tibet to the side of the Indus does not have to propagate inelastically to the east; it could well be offset by surface mass removal in the Three Rivers region. A simple mass-balance calculation suggests that a modest eustatic rate of only 0.6 mm/yr could account for a significant proportion of the eastward crustal movement. Thus, it is possible that all the eustatic crustal advection out of Tibet is to be consumed by erosion.

T41E-04 0930h
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The Nanga Parbat-Haramosh Massif (NPM) is located in the north-west Himalayas of Pakistan and is a major expression of Indian crust surrounded on three sides by the incised arc rocks of the Ladakh and Kohistan terranes. Located in the north-west Himalayan syenogranites, the NPM is a complex composite tectonic and metamorphic history involving an earlier Himalayan metamorphic event associated with crustal thickening and most probably the rapid erosion and exhumation. Here we focus on the western margin of the NPM and fluid flow are coincident with the highest topogra-

T41E-05 0949h
Structural and Chronology of Nanga Parbat-Haramosh Massif
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The western Himalayan synclinorium, in northern Pakistan, culminates in the Indus-Makran Dynamic Phase (Himalayan; NoM). These structural and seismic age results show that the NPM is a young (~10-100 m/yr) and active crustal-scale nivalthrust platform. The Indus-Makran Dynamic Phase (Himalayan; NoM) has resulted in the formation of the NPM, which is a major expression of Indian crust surrounded on three sides by the incised arc rocks of the Ladakh and Kohistan terranes. Located in the north-west Himalayan syenogranites, the NPM is a complex composite tectonic and metamorphic history involving an earlier Himalayan metamorphic event associated with crustal thickening and most probably the rapid erosion and exhumation. Here we focus on the western margin of the NPM and fluid flow are coincident with the highest topography in the world.

T41E-07 0930h
Distribution of Partial Melt Beneath Nanga Parbat, Northern Pakistan
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A broadband magnetotelluric survey has been conducted around Nanga Parbat (elevation 8135 m) in order to constrain the distribution and structure of partial melt beneath the mountains. This has experienced an average rate of 3.6-6.0 x 10^-12 km of exhumation in the past 3 My, resulting in a range of average rates of 3.6-6.0 km.

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9899 Fall Meeting
T41D-05 0830h POSTER
Complexities in the Seafood Spreading History of the Lee Basin
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We present a ~200m resolution compilation of Lee Basin marine geo-
physical data (L1-M2). A refined 2D magnetization inversion is com-
puted from the merged bathymetry and magnetic data reveals average Brun-
hes opening rates (~0.07 mm/yr) on the NW Lee Spreading Center, as well as
high-precision low-angle magnetic anomalies (in between 0.05 and
100 mm/yr; in northwest) on the Eastern and Central Lee Spreading
Centers and the Lee Extensional Transform Zone (ELST, CLCS, and
LETS) respectively. Studies of the magnetization inversions in conjunction
with interpreted neovolcanic zones from the sidescan data show that the
MT2 has rotated and overprinted crustal fabric fold crest over two
millions. An overlapping spreading center links the southern
limb of the MTJ with the Panthalic Rift. An ~0.15 trend in the
crust’s fabric parallelism from the MTJ to the Panthalic Rift implies a
clockwise rotation for these spreading segments since anomaly 2 time. A
series of magnetic lineations in the western basin are identified; however, the
eye from their identification remains elusive. The study of the
passing of these lineations mimics that formed by seabed spreading on
the currently active CLCS and LETS.

T41D-07 0830h POSTER
Asymmetric sea-floor spreading in the central Mariana Trench
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We present detailed sea-floor spreading history of two ridge segments in the central Mariana Trench (MT) at 19H and provide the evidence of relative movement of the spreading area toward the trench, using the bathymetry, the magnetic and the gravity data. Narrow-axis basin is bathymetry and shipboard magnetic data were collected by two surveys (KFR2 and YK02) in this area. We also used marine gravity anomaly from satellite altimetry (Sandwell and Smith, 1997). The area was chosen because of two ridge segments near the STUW-1 zone and space shipboard bathymetry (Sandwell and Smith, 1997). Sea-floor spreading of the MT is very similar to that of the slow spreading Mid-Atlantic Ridge in two main points; 1) the morphology shows existence of median valley neovolcanic zone and spreading axis segmentation, and 2) the mantle Bouguer anomalies show existence of “Bull’s eye” along the axis. Lineaments are asymmetric sea-floor spreading in the MT. The asymmetric features are 1) the center of the “Bull’s eye” in the northern segment locus west of the spreading axis and 2) rel-
ative movement toward the trench and toward the east (trench side). The axis movement are accelerated by the crustal age. The down-
ward compaction of the basin is caused by the forward fold movement. In the study, we identified the geosyncline axis until 6 Ms (magnetic isochron 3A) in the western side, while in the east we could follow only 2 Ms (magnetic isochron 5A) as the age identification from the northern segment near eastward ridge axis jump by 5 km at the age of 3 Ma when the half-spreading rate is slowing down from 22 to 15 cm/yr. The result from the southern segment suggests that the axis moved outward by 30 km between 3 Ma and 1 Ma. Furthermore, the present axis of the southern segment determined from bathymetry, located much closer to eastern Bruneau-Matuyama boundary. The age misalignment toward the trench is probably the reason of the magnetic anomaly in the east side and this movement probably leads that the positions of the spreading axis are moving forward and toward the trench. The asymmetry is a key point to understand mechanism of arc-spreading.
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