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Rock magnetic and anisotropy of magnetic susceptibility(AMS) of earthquake affected soft sediments: Examples from Shillong and Latur (Deccan Trap), India.

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Rock magnetic and anisotropy of magnetic susceptibility (AMS) of earthquake affected soft sediments: Examples from Shillong and Latur (Deccan Trap), India.

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Combined rock magnetism and anisotropy of magnetic susceptibility (AMS) studies on earthquake induced soft and non-soft sediments from Shillong and Latur, India have thrown up interesting results. The morphology of hysteresis loops, the pattern of isothermal remanent magnetization (IRM) acquisition, and temperature dependence of susceptibility indicate that titano-magnetite/magnetite is the main magnetic carrier in these sediments.

We also analyzed the anisotropy of magnetic susceptibility (AMS) of liquefaction features within the seismically active Dauki fault, Shillong Plateau. We discovered that host sediments (non-liquefied), are characterized by an oblate AMS ellipsoid and liquefied sediment are characterized by a triaxial AMS ellipsoid, well grouped maximum susceptibility axis K1 (NNW-SSE trend). Field evidence and AMS analysis indicate that most of these features were emplaced by injection inferred to be due to seismically triggered fluidization.

Anisotropy of magnetic susceptibility (AMS) of deformed and undeformed unconsolidated clay samples of Deccan Trap terrain from the ∼2000-year-old paleoearthquake site of Ther village, Maharashtra, India, was also studied. Such deposits are rare in the compact basaltic terrain because of which the results acquired are very important. The undeformed clay samples exhibit typical sedimentary fabric with an oblate AMS ellipsoid, whereas the deformed samples are tightly grouped in the inferred compression direction, probably effected by an earthquake, exhibiting prolate as well as oblate AMS ellipsoids.

Rock magnetic and AMS methodology can help understand the behavior of different sediments to the regional deformational processes active in the Himalayan region, and possibly local deformational activities in the compact Deccan trap region. The accumulating stress and strain direction can be delineated to infer strike of the forces accumulating stresses. These studies can be used to build the chronology of past earthquakes.