Geophysical Research Abstracts
Vol. 12, EGU2010-13884, 2010
EGU General Assembly 2010

DRM or pDRM? - intriguing results from a new type of experiments

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Characteristics of detrital remanent magnetization (DRM) in lacustrine and marine sediments has been extensively studied for half a century. Experiments with synthetic and natural sediments have resulted in the present-day consensus that a genuine DRM may exhibit significant inclination error while a post-depositional DRM (pDRM) will truthfully record the ambient field some time after deposition. Experimentally established time-delay of pDRM has recently been challenged based on observations of natural systems as well as experiments with flocculating sediments.
Models for DRM/pDRM-acquisition are presently purely phenomenological, with no predictive power. Realistic models require parameterization of a very complex system composed of magnetic grains with a range of geometries, sizes and magnetic states in addition to the interaction with the 'non-magnetic' matrix.
As a first step to ascertain properties of the magnetic grains in natural sediments, controlled re-deposition experiments have been performed to assess the relative fraction of pristine magnetic moments in a marine sediment. Prior to re-deposition in different ambient magnetic fields, sediment-suspensions were magnetized in DC-fields (max 300mT). Results reveal a) a gradual and substantial increase of DRM-intensity (up to 10 times of the pristine material), b) increasing inclination errors with increasing magnetization of the suspensions, c) decreasing MDF of DRM with increasing magnetization, d) almost identical and field-linear relative paleointensity (RPI) based on DRM/MS, DRM/ARM and DRM/SIRM and e) AMS-lineation controlled by ambient magnetic field.
Implications of these observations for DRM-pDRM mechanisms will be discussed.