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Preliminary Results of Core Description from the Hole-A of Taiwan Chelungpu-fault Drilling Project

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In this preliminary result for general core description of TCDP, we will summarize the variation of lithology, bedding dip, structure attitude and fracture density with the depth between 500m and 1800m and the locations of fault zones Based on the lithology, the boundaries between the Cholan Formation, Chinshui Shale and Kueichulin Formation are roughly at 1027m and 1290m, respectively. The deeper contacts between formations can not be determined easily just by our lithology column. Most bedding dip is 30º, but the dip changed dramatically into 60- 70º right after 1785m. Based on the attitude (dip direction/dip) and the sense of shear, five different structural groups can be identified as: thrust (105/20-60), left-lateral fault (015/30-80), right-lateral fault (195/30-80), backthrust (285/30) and normal fault (105/5-10). From the orientation statistics, the number of structure with the thrust orientation is highest. Structures with strike-slip fault orientations are the next higher ones.

Nine fault zones between 500 and 1800m are observed. The shallower four fault zones are within the Chinshui Shale. For the thrust of Fault Zone 1111 (FZ1111) and FZ1153, the grain size of hanging wall is finer than that of foot wall. The feature of lithology is opposite in the FZ1222 (sinistral fault with normal shear), i.e. the grain size of hanging wall is coarser. For FZ1241 (backthrust), it looks like creep deformation without distinct gouge. The FZ1111 and FZ1153 are the candidates of the fault zone which slipped during Chi-chi earthquake according to the location and deformation structure. Slickeside with a rake of 70º SW on the fragile black material within the bottom of FZ1111 is observed. The orientation of this slickenside set is consistent with slip direction from seismic data inversion, suggesting the black material could be the product of slip deformation during Chichi earthquake. The deeper five fault zones (>1500m) are located in specific spacing of rough 50m. Also,

they are usually developed within the lithology with finer grain size and closed to the lithology boundary. These five fault zones include thrust faults and strike slip faults.

Keywords: TCDP; core; fault; fracture; lithology.