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Observations of dust mixed with pollution transport event from Pakistan area to Himalayas

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Large dust storm blew through the Indus Valley and Thar Desert, along the border between Pakistan and India since 12 June, 2006 and reached to the mountain region in the North East India later on (NASA - MODIS). Very high aerosol index value (3.5-4) was observed in North Indian region during 12-14 June 2006. The dust transport was significantly detected at Nainital observatory (29.4˚N; 79.5˚E; 1958 m asl, Central Himalaya) (Hedge et al., 2007) as well as at Nepal Climate Observatory at Pyramid (NCO-P, 27.9˚N; 86.8˚E; 5079 m asl). Aerosol number concentration in coarse and giant mode was strongly affected by this event at Nainital Observatory, while accumulation mode particles and black carbon do not show enhancement, suggesting insignificant contribution from local sources (Hedge et al., 2007). On the contrary NCO-P observatory detected a simultaneous and prolonged increase of accumulation and coarse particles number, black carbon, ozone and PM1, as well as coarse particle number. Moreover at NOC-P the single scattering albedo fall down from 0.98 to 0.95 and diurnal cycles driven by land breezes, typical of this site, are quite completely

hidden by large scale circulation. The dust transport recorded at NCO-P lasted longer with respect to the observation at Nainital observatory and was enriched with polluted air mass. This testify that also during Asian monsoon period, events of long range dust transport mixed with pollution air masses can reach high Himalayan mountains and glaciers, as confirmed by trajectories analysis.