Dust storms frequently occur during spring in the arid regions of East Asia, and emit a large amount of the dust into the atmosphere. To evaluate the influence of the dust on the climate, it is important to estimate the total amount of the dust in source regions. The Taklimakan Desert is one of the main sources of the dust storms in East Asia. In the present study, lidar observations, satellite remote sensing and ground base observations of the dust at Aksu, Xinjiang, China were used to estimate the total amount of the dust in the Taklimakan Desert.

Firstly, a mass extinction conversion factor (MECF), which is a ratio of lidar-derived extinction to the mass concentration of the dust measured by Andersen sampler, was estimated for the background condition and for the dust event. Secondly, a relationship between the aerosol optical thickness (AOT) derived from the lidar and TOMS Aerosol Index (AI) was determined. Thirdly, the total amount of the dust in the Taklimakan Desert was estimated using the MECFs, TOMS Aerosol Index and lidar observations. It is 200 Gg during the background conditions, and 400 - 800 Gg during the dust event in April 2004.

In addition, characteristics of the Taklimakan dust were investigated by the ground / space borne CALIPSO lidars. For a typical case, a vertical scale of the dust reached to 5 km (ASL) and a horizontal scale was about 1000 km, occupying 70 % of the Taklimakan Desert.