

abstract: A new system for three-dimensional (3D) track length measurement is described. In this system, all track observations are made on a screen of a high-resolution video monitor. Horizontal track lengths are determined using a laser beam connected to an *X-Y* plotter. Vertical distances can be measured with a laser range-finder. The system is operated semi-automatically and all track data are stored in a personal computer. The accuracy and precision of 3D length measurement depend upon both dip angle of a measured track and the refractive index of an observed material. Two cases of application with this system show that 3D track length approaches have following advantages: (1) higher efficiency of data acquisition in confined-track approach, (2) higher resolution of track length measurement in semi-track approach, and (3) more information on track orientations in confined-track or semi-track approaches. Especially, the 3D semi-track approach should be useful when track densities are too low to have enough numbers of confined tracks.