



## Determination of the normal height of the Everest based on EGM 2008

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The orthometric height  $H$  is the height above the geoid, which is the equi-geopotential surface nearest to the mean sea level. The normal height  $H^*$ , however, is the height above the quasi-geoid, which fast coincides with the geoid in the ocean but deviates from the geoid a little in the land areas. In China, the height datum system is based on the quasi-geoid, i.e., in most cases we use the normal height. GPS technique provides the coordinates of an arbitrary point  $P$  on ground with the accuracy better than 1 cm, in the geocentric Earth-fixed system. Hence, with the same accuracy, GPS technique provides the geodetic coordinates of the point  $P$ . Then, if the quasi-geoid is determined, the normal height can be subsequently determined. In the present paper, we focus on the determination of the normal height of the Everest based on the international gravity field model, EGM 2008. The geodetic coordinates of the Everest could be obtained by different sources. We use the coordinates provided by Chinese Surveying Bureau. In the frame of Molodensky theory, based on EGM 2008 (with degree 2190), we determine the normal height of the Everest by two approaches: point-wise approach and area-average approach. By point-wise and area-average approaches, our results show that the normal heights of the Everest are  $H_{EGM2008}^* = 8847.32$  m and  $H_{EGM2008}^* = 8847.37$  m, respectively. Concerning the normal height determination of the Everest, we find that the difference between our result and the result provided recently by Chinese Surveying Bureau is less than 0.1 m. Using EGM 96 however, we find that the difference is around 1 m. This study is supported by National 863 Project of China (Grant No.: 2006AA12Z211) and National Natural Science Foundation of China (Grant No.: 40637034; 40574004).