Summary of the one-year laser topographic observation by Kaguya-LALT

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A global topographic map of the Moon with a spatial resolution less than 0.5 degrees has been derived by the laser altimeter (LALT) onboard the Japanese lunar explorer KAGUYA (SELENE) using data from 30 December 2007 to 27 October 2008. This map reveals much more precise and realistic topographic details for scales less than a few hundred km than in the previous topographic one such as Unified Lunar Control Network 2005. The highest and lowest points on the Moon are observed in the south rim of the Dirichlet-Jackson Basin and inside of a small crater in the Antoniadi crater respectively. Lunar figure parameters such as the mean radius (1737.15 km), COM-COF (Center of Mass - Center of Figure) offset (1.93km), and the polar flattening (1/581.9) are obtained from the new spherical harmonic topographic model STM359_grid-02 derived from LALT observation. The model also shows lunar topographic spectrum to have more power than the previous one and the flat characteristics between 30 and 70 degrees. The calculation of the solar illumination rate around both polar regions using new topographic data revealed that there is no eternal sun lit area on the Moon.