

Design and implementation of an altazimuth mount drive for a Newtonian telescope coupled to a DSLR camera

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A telescope mount is the mechanical structure which supports the optical elements of the telescope. When obtaining images by attaching a camera to the telescope the performance of the telescope mount becomes critical. Altitude-Azimuth (Altazimuth) telescope mount is a design with two rotational axes. Motorized drive system of an Altitude-Azimuth mount requires a mechanical design compatible with the physical and optical parameters of the telescope. Especially when mount is synchronized with earth's rotation, step size of the motors should be less than the camera field of view (FOV). In this research a motor driven mount was designed to accordant with a Digital Single Lens Reflex (DSLR) camera for a 0.25 m F/10 Newtonian telescope. Parameters of the telescope drive design depend on the weight of the mirror, focal length of the objective mirror and the FOV of the camera attached. Torque of the telescope mount around two axes was calculated considering a slew rate of 90° from 30 seconds. Subsequently, the resolution of the motor steps was derived and the FOV of the camera was compared. Final results indicated that the camera FOV is 0.04874527 arc minutes and motor resolution is 0.00117100 arc minutes. It is evident that the motor resolution is substantially less than the camera FOV and therefore the mechanical drive design of the telescope is suitable for the DSLR camera.

Keywords: *Altitude-Azimuth mount, Camera field of view, Resolution of the motor steps, Telescope mount*

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