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Differential Proper-Motion Measurements of The Cygnus Egg Nebula; The Presence of Fast Equatorial Outflows RACHAEL TOMASINO, TOSHIYA UETA, University of Denver, BRIAN FERGUSON, Space Telescope Science Institute — We present the results of differential proper-motion analyses of the dust shell structure in the Egg Nebula (RAFGL 2688, V1610 Cyg), based on the archived two-epoch imaging-polarimetric data in the optical taken with the Hubble Space Telescope. We measured the amount of motion of local structures and the signature concentric arcs in the nebula by determining their relative shifts over an interval of 7.25 yr. We discovered that the optical polarization characteristics of the Egg Nebula was influenced by the marginal optical thickness of the circumstellar shell and the illumination of the nebula was done in two-step mechanism - most of the nebula is illuminated by the secondary/dust-scattered starlight emanating from the bipolar lobes themselves due to the central concentration of dust grains of more than 10^3 AU diameter that regulates the seepage of the starlight from the central region. Nevertheless, based on two types of differential proper-motion analyses we revealed interesting dynamics of the lobes and concentric arcs, which should provide solid constraints on the subsequent theoretical/numerical investigations.

Rachael Tomasino
University of Denver

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