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A Study of Null and Time-Like Angular Geodesics in Kerr-De Sitter Space-Time NABIN MALAKAR, Department of Physics, SUNY at Albany, UDAYARAJ KHANAL, Central Dept Physics, Tribhuvan University, Nepal — In this work, some aspects of the angular null and time-like geodesics in Kerr-de Sitter space-time are investigated. The trajectory, of massive and mass-less particles in various geometries, is described by the geodesics. In particular, trajectories of massive and mass-less test particles around a spherically symmetric gravitating-rotating body with asymptotically flat space-time is depicted by geodesic motion in Kerr space-time. A rotating black hole in asymptotically de Sitter space-time can be described by Kerr-de Sitter geometry. Such a space-time includes a finite cosmological constant (λ). Physically, λ is related to the vacuum energy density and implies a pre-existing curvature. The trajectories, of particles around Kerr-de Sitter black hole in a circular orbit, are unstable and oscillate about the equatorial plane but do not reach the singularity. These geodesics are found to be confined within a maximum angle about the equatorial plane. This maximum angle is dependent on the cosmological constant. So it is inferred that the thickness of accretion disks should be related to the value of cosmological constant.

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