Angular Mechanical Energy

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Abstract

This paper presents the principle of conservation of the
angular mechanical energy for a particle which moves in
a uniform force field.

Angular Mechanical Energy

The angular mechanical energy E_a of a particle A of mass m_a which moves in a uniform force field, is given by:

$$E_a = \tfrac{1}{2}\, m_a (\mathbf{r} \times \mathbf{v}_a)^2 - m_a (\mathbf{r} \times \mathbf{a}_a) \cdot (\mathbf{r} \times \mathbf{r}_a)$$

where $\mathbf{r}$ is a position vector which is constant in magnitude and direction, and $\mathbf{v}_a$, $\mathbf{a}_a$ and $\mathbf{r}_a$ are the velocity, the constant acceleration and the position of particle A.

The principle of conservation of the angular mechanical energy establishes that if a particle A moves in a uniform force field then the angular mechanical energy of particle A remains constant.