**DESIGN OF A PLANETARY CYCLE DRIVE SPEED REDUCER**

**ABSTRACT**

Epicyclic gearing or planetary gearing is a [gear](https://en.wikipedia.org/wiki/Gear) system consisting of one or more outer gears, or planet gears, revolving about a central, or sun gear. Typically, the planet gears are mounted on a movable arm or carrier which itself may rotate relative to the sun gear. Epicyclic gearing systems also incorporate the use of an outer ring gear orannulus, which meshes with the planet gears. Planetary gears (or epicyclic gears) are typically classified as simple or compound planetary gears. Simple planetary gears have one sun, one ring, one carrier, and one planet set. Compound planetary gears involve one or more of the following three types of structures: meshed-planet (there are at least two more planets in mesh with each other in each planet train), stepped-planet (there exists a shaft connection between two planets in each planet train), and multi-stage structures (the system contains two or more planet sets). Compared to simple planetary gears, compound planetary gears have the advantages of larger reduction ratio, higher torque-to-weight ratio, and more ﬂexible conﬁgurations. The axes of all gears are usually parallel, but for special cases like [pencil sharpeners](https://en.wikipedia.org/wiki/Pencil_sharpeners) and [differentials](https://en.wikipedia.org/wiki/Differential_(mechanical_device)), they can be placed at an angle, introducing elements of [bevel gear](https://en.wikipedia.org/wiki/Bevel_gear) (see below). Further, the sun, planet carrier and annulus axes are usually [coaxial](https://en.wikipedia.org/wiki/Coaxial). Epicyclic gearing is also available which consists of a sun, a carrier, and two planets which mesh with each other. One planet meshes with the sun gear, while the second planet meshes with the ring gear. For this case, when the carrier is fixed, the ring gear rotates in the same direction as the sun gear, thus providing a reversal in direction compared to standard epicyclic gearing.

In this project, we will design a planetary gear system with standard dimensions in solid works premium 2014 software. We can also perform static & structural analysis on this gear system. And we show the effect of loads on the planetary gear system by stress, strain and deformation results.

