

## **Optimization of Propellant Grain with the Aim to Improve Structural Integrity**

Propellant grain geometry determines the ballistic performance of a solid rocket motor. Inability of the propellant grain to comply with the structural integrity requirements leads to catastrophic motor failure. The acceptable grain design is a tradeoff between the ballistic and structural integrity requirements. This work shall focus on development of analytical expression for burn perimeter and port area as a function of burnt web for different burning zones of truncated star with elliptical tip. The aim of this work is to obtain a grain configuration with improved structural integrity but similar ballistic performance. Also the availability of analytical expressions for burn perimeter and port area makes the search for optimal grain much more efficient as it obviates the long computation time.

Computational Skills: Any of the listed software: Matlab, C++, Fortran, Ansys and or ABACUS