

# 26th National Symposium on Cryogenics and Superconductivity

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## Study of Dual Bell Nozzle

### Content :

Owing to the improved performance, several nozzle concepts have been introduced, that promises a gain in performance when compared with the conventional nozzles. Altitude adapting nozzles are the most advanced technology in this field. As such the better popularity is among them is Dual Bell Nozzles. Many researchers have presented the occurrence of lateral side-loads but failed to explain their detailed flow mechanisms. Also, the key parameters governing fluctuations remain unknown. The capturing of the flow and transition from one bell to another during start up and shutdown in dual bell nozzle has not been studied much. So the motivation for the present work is to get an understanding of the flow behaviour in Dual bell Nozzle highlight given to separation. Being an altitude adaptive nozzle, flow separation and side loads being a major concern of such nozzle, this study can contribute to its better understanding. The comparison between the existing High Altitude nozzles will help to get the improvements obtained. Hence so such a study of flow analysis in Dual bell nozzle will help to implement such new concepts in future launching vehicles especially SSTO (single stage to orbit) launchers and maximising payloads in the future launch vehicles.

### Summary :

This study is mainly highlighted on the flow analysis in the dual bell nozzle by varying back pressure. So by this varied backpressure a transition from one bell to the other can be captured.

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