Poster: FIP/P3-51: Pellet fuelling prospects and injector system for Aditya-U tokomak

Summary

- Core fueling of high temperature plasma is an important issue in Fusion devices. From Engineering prospect pellet injection from the high field side of the plasma using curved guide is still a challenging job. Pellet injection speed is limited by the curved guide tube. Much developmental work is ongoing world wide for low speed injector and curved guide tube development.
- This work is focused on to develop a small pellet size, low speed injector for pellet injection in medium or small size fusion devices.
- Conventional technique for low speed pellet injection: Mechanical punch assisted fast valve operation.
- Current Development: Tapered barrel for low speed injection [*G. MOTOJIMA et al., Rev. Sci. Instrum. 87, 103503 (2016)*].
- We present a complimentary study for injector barrel design on gas gun based zero barrel length concept using simpler design
- Injector design parameter :
  pellet size: 1-1.2 mm (length=diameter) V_p= 300 – 500 m/s
  Injection frequency: 1 pellet in 3 minutes.
  Expt. parameter reported in this study: 1.6 mm and V_p> 600 m/s
- Low speed injector development with this technique may help for pellet injection experiments through curved guide tube for high field side pellet injection in fusion machine.