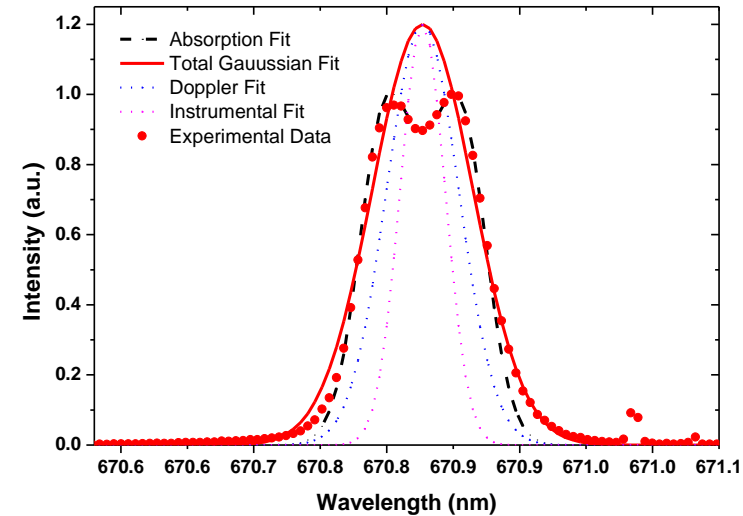


Summary slide

Investigation of Self-absorbed Lithium Spectral Line Emissions During Li_2TiO_3 Injection In Aditya-U Tokamak

- Temporal and space resolved profile of Lithium emission line at 670.8 nm has been measured on Aditya-U tokamak during EPI experiments
- Time resolved profile of the measurement suggest sudden hike in total particle density due to pellet
- **self-absorption** is observed in space resolved spectra
- Opacity is measured by fitting Gaussian line profile with opacity function to the experimental spectra
OPACITY = 1.55
- Opacity is product of absorption coefficient and depth of the medium
ABSORPTION COEFFICIENT = 0.25 cm^{-1}
- This coefficient has proportional relation with neutral lithium density
LITHIUM DENSITY $n_{\text{Li}} \sim 2 \times 10^{16} \text{ cm}^{-3}$
- Radiative power loss (derived) • Input power is
 $P_{\text{loss}} \sim 148 \text{ kW}$ **$P_{\text{in}} \sim 260 \text{ kW}$**



FOR THE FIRST TIME
self-absorption
in Lithium spectral line has been
observed with Li_2TiO_3 pellet
experiment

This shows that more than 60% of power is radiated due to the pellet and then it can be said that the sudden plasma disruption has happened due to radiative cooling of the plasma.