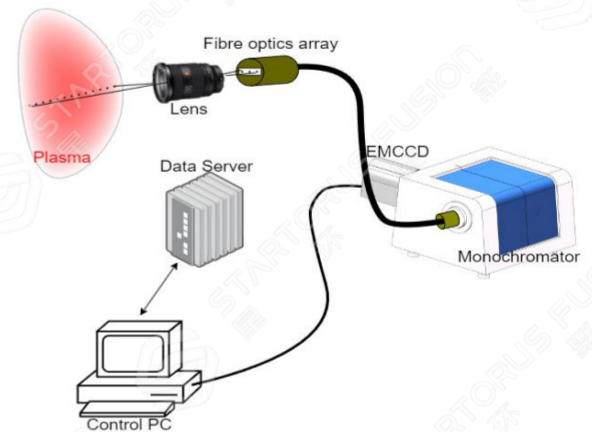


# Ion Doppler Spectroscopy (IDS)

## Introduction

Ion Doppler Spectroscopy (IDS) is a method for diagnosing ion temperatures in plasmas that does not rely on beam injection. In a plasma, characteristic spectral lines produced by electron transitions in excited states of specific ions exhibit a certain thermal broadening (Doppler broadening). By measuring the Doppler broadening and frequency shift of ion characteristic spectral lines, analysis of ion temperature and flow velocity can be achieved. The IDS diagnostic and automated data analysis system developed by Startorus Fusion can achieve measurements of plasma temperature distribution and flow velocity distribution without beam injection, providing centimeter-level spatial resolution and millisecond-level time resolution.



## Parameters

- Number of channels: 1~40, customized light receiving system
- Measurement spectral line: 300~800 nm measurement spectral line (recommended ~500 nm)
- Spatial resolution: > 2 cm, customized according to requirements
- Time resolution: > 1.5 ms, according to the number of channels
- Slit width: 20~100  $\mu\text{m}$
- Spectral resolution: 0.03 nm@313.1 nm
- Measuring surface line dispersion: 0.6 nm/mm~0.85 nm/mm

## Applications

Ion Doppler Spectroscopy (IDS) can be applied to high spatial and temporal resolution measurement and analysis of ion temperature and flow velocity distributions in plasmas.