Purpose? We want to prove that a new LIF scheme in Xe II can work so that in a two ion species plasma (Ar + Xe), both ion species may be diagnosed with diode laser based LIF.

Here follows:

1. The story of the new LIF scheme in Xe II (yes, there’s a story).
2. Procedures for the measurement of ion velocity distribution functions (ivdfs) in xenon plasmas.
3. Pictures of Xe II ivdfs.

The first Xe II LIF scheme accessible by diode lasers in the visible range of wavelengths is shown below.

The LIF signal for Xe II, with excitation at 680.570 nm. There is more to this signal than what meets the eye. This signal can be used to calculate ion velocity distribution functions (ivdfs).

The LIF setup involves a diode laser (Sacher Lasertechnik TEC 100-680-20), Lock-in Amplifier, beam modulator, and PMT (Hamamatsu R6995).

Summary result? We have proven that a particular LIF scheme in Xe II can yield useful LIF signals accessible by diode lasers in the visible range of wavelengths near 680 nm.

References:

What is the saturation intensity of the transition? What power is required to achieve a useful LIF signal?