Design of CXRS diagnostics for the COMPASS tokamak and first results

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Charge Exchange recombination spectroscopy (CXRS) diagnostic has been recently installed on the COMPASS tokamak. Its purpose is to derive impurity ion temperature and toroidal plasma rotation profiles from properties of an active charge exchange component of the impurity spectral line. The active component is generated by charge exchange collisions between deuterium atoms injected by a neutral heating beam and plasma impurities, e.g. helium, carbon or boron. The collecting optics are separated into 3 independent views, allowing optimal observation of the beam path across the whole minor radius. In total, 40 and 40 view chords are available for beam and background radiation observation. The collected light is then guided with optical fibres to a high throughput spectrometer McPherson 207 (0.67m, f/4.7), which can be tuned to any spectral band within the whole visible light region. This gives the freedom to choose spectral lines of different impurity elements on shot to shot basis, to accustom to actual plasma composition. The spectra are recorded by an EMCCD camera Andor iXon Ultra 888, which can simultaneously accommodate 30 fibres without introducing a cross-talk between individual spectra. In this contribution a description of the CXRS diagnostic will be given together with analysis of the first measured spectra.