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Spectroscopic measurements for the diagnostics of intense heavy ion beams ALEXANDER FEDENEV, GSI, Helmholtzzentrum, Darmstadt, ANDREAS ULRICH, TU-Muenchen, Physik Department E12, Germany, DMITRY VARENTSOV, GSI, Helmholtzzentrum, Darmstadt — Spectroscopic studies of intense, focused heavy ion beams are presented. They are motivated by the concept to measure beam profiles optically via the fluorescence induced in a target gas by the ion beam. Processes such as excitation by secondary electrons may influence the measurement. A concept to minimize this problem is to use the fluorescence of ionized species since the excitation cross sections are almost negligible for electrons but high for the collisions of the heavy projectiles. Spectra of argon and nitrogen excited by a pulsed 300 MeV/u Uranium beam from the heavy ion synchrotron SIS at GSI Darmstadt were recorded for a wavelength range from 280 to 950 nm and target pressures ranging from 100 to 1500 mbar. Beam profiles derived from the various emission features are extracted from the intensity distribution along the image of the spectrometer slit. The time structure of the overall light output as well as the spectrally resolved light emission was also studied.

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