Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

On the possibility of measuring the optical spectrum of light sources by means of a rotating mirror LUIS BILBAO, INFIP, CONICET-UBA, Argentina, LUIS BERNAL, UNMDP, Mar del Plata, Argentina — We report the operation of an apparatus for measuring optical Doppler shift based on a rotating mirror, and its preliminary application to the measurement of the spectrum of some light sources. Optical Doppler shift experiments are not a simple task since light source cannot usually be moved in a sufficiently smooth and uniform manner to keep the level of noise well below of that of the signal. Using a rotating mirror it is possible to overcome many of the noise generating effects. The beam from a light source passes a beam splitter that separates the beam, part is reflected from the advancing side of a rotating mirror; part is reflected from the receding part of a rotating mirror. After reflection the beams are recombined using a beam splitter and measured by a fast photodiode. Beat between the two beams produces fluctuations in the light intensity at the photodetector [1]. Since the spectrum of the measured interference signal is proportional to the spectrum of the original source, then it is possible to use this experiment as an online scanner of the light spectrum of the source. We describe the preliminary results, and discuss the detection limits and the possibility of using the apparatus for plasma diagnostic.

[1] L. Bernal and L. Bilbao, Am. J. Phys. 75, 216-219 (2007).

Luis Bilbao
INFIP, CONICET-UBA, Argentina

Date submitted: 14 Jun 2010 Electronic form version 1.4