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*Comment*

# Comment on "Measure of absolute speed through the Bradley aberration of light beams on a three-axis frame" by G. Sardin

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In the above-mentioned paper [1], G. Sardin proposed an electromagnetic speed-meter which allows one to measure absolute speed without the need of any external reference. The author described the system of three orthogonal laser beams with three optoelectronics sensors (light shift detectors). The shift of the beam spot due to aberration should be observed and measured. The purpose of this comment is to show that the project of G. Sardin leads to a negative result.

Since the last word in physics belongs to experiment, we have built a system similar to the one described by Sardin (see figs. 2 and 3 in [1]) in order to check whether the aberration shift of light predicted by him will take place. Our optical system is presented in fig. 1.

The optical rail with a He-Ne laser and a shift detector was fixed on the rotating table (in the horizontal plane). As shift detector a CCD camera (model ST-6V) with a pixel size of 11.5 $\mu$m was used. The distance between the light source (laser) and the CCD was 1.35 m. The diameter of the carefully focused light spot on the CCD plate was about 7 pixels. Measurements were made at sunset, because in that moment the Earth-Sun direction lies in

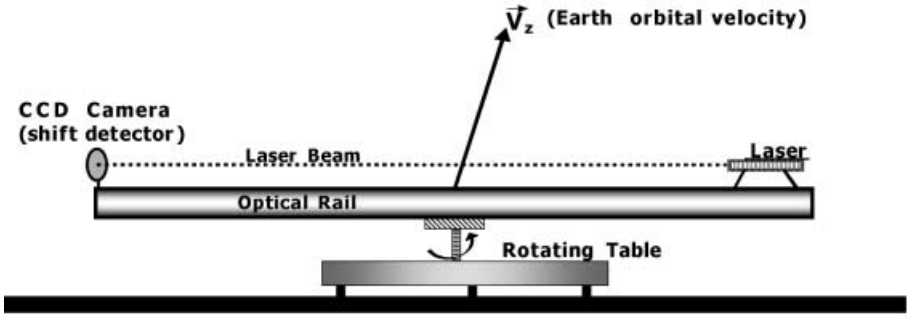


Fig. 1 – Optical system used in our experiment.

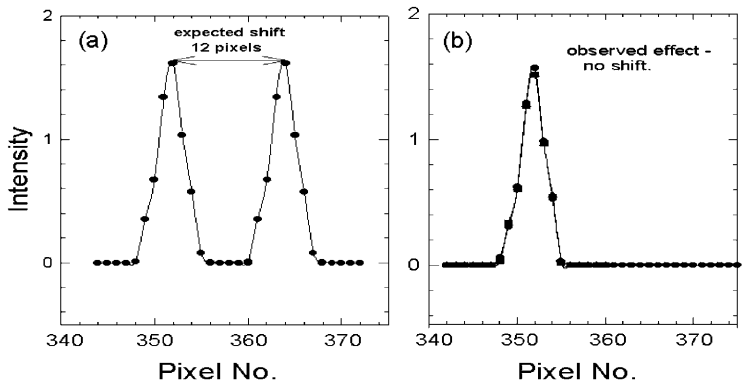


Fig. 2 – Intensity profile of the laser spot on the CCD plate. (a) Result predicted in [1] when the shift of the spot takes place. (b) Observed (negative) result.

the horizontal plane. At first —according to the operating procedure presented in [1]— the optical rail was oriented exactly in the direction of the Earth tangential speed around the Sun. The image and the position of the beam spot on the CCD plate were registered and were taken as the zero reference point.

Subsequently the rail was rotated by $\pm 90\,^\circ$ and the position of the light spot was registered once again. If the predictions of Sardin were correct a shift of the position of the light spot on the CCD plate should be observed. The CCD-laser distance is 1.35 m and the orbital velocity of the Earth is about 30 km/s, thus the expected shift of the laser spot should be about 135 $\mu$m (about 12 pixels on our CCD plate —see fig. 2a). The intensity profile of the laser spot on the CCD is presented in fig. 2. As is clearly seen from fig. 2b, contrary to Sardin's predictions, no shift of the light spot was observed.

Next we have repeated our measurements changing the orientation of the optical rail in steps of $30\,^\circ$. In each situation we observed no shift of the light spot. This means, that the setup described by G. Sardin [1] probably cannot be used to measure an absolute speed.

REFERENCES

[1] Sardin G., *Europhys. Lett.*, **53** (2001) 310.