A Simple Experimental Setup for the Demonstration of Fresnel-Arago Laws and the Realization of a Laboratory Exercise

The primary goal of this work was to create an experimental setup for an easily feasible demonstration of Fresnel–Arago laws and the realization of a laboratory exercise using red and green laser light. Modern theoretical explanations of the interference of polarized light use complex mathematical apparatus for their derivation, with which many students are not acquainted. On the other hand, the formulations of Fresnel-Arago laws, which have played a basic role in elucidating the concept of polarization of light, are much more accessible for students. In our setup a birefringent calcite is used as a beam splitter, and by adding a diverging lens (commonly used for image magnification), a large image of overlapping spots is obtained at a short screen distance. Depending on the level of beams overlapping at the position where the divergent lens is placed, a different intensity distribution of the interference fringes will be obtained. The same setup also allows the reconstruction, relatively simple processing of the interference image, without the use of expensive devices and obtaining a clear, sharp and large interference image, make this setup very suitable for realization of a demonstrations and exercise for high school, undergraduate and master's students.

Primary author: JOVANOVIĆ, Jelena (University of Belgrade, Faculty of Physics)

Co-authors: Dr IVKOVIĆ, Saša (University of Belgrade, Faculty of Physics); Prof. OBRADOVIĆ, Bratislav (University of Belgrade, Faculty of Physics)

Presenter: JOVANOVIĆ, Jelena (University of Belgrade, Faculty of Physics)