

Optical Distance and Optical Distance Difference in Moving Systems

G. Korom

Faraday Institute for Theoretical Physics, Hungary

It is shown based on a gedanken-experiment, that the difference of the two wave-propagations and the “optical” path difference (OPD), or more simply the optical distance (OD) is the same only in systems resting in the conductive medium. In case of moving sources and moving observers, the OD is equal with the actual distance of the source and the observer from each other in the phase-space, and is not necessarily equal with the length of the wave propagation across the medium. It has turned out that the phase difference of the amplitude-splitted, and later reunited electromagnetic vibrations in the Michelson-Morley experiment will not change while the speed difference of the Ether-wind is changing, and/or the Michelson Interferometer is rotating. Only phase shifts with equal magnitude will occur at the observers, but the interferometer is insensitive to these shifts, and the observed frequency remains constant because of a double Doppler effect. Consequently, the circular interference fringes observed on the screen will not be dislocated. These results urge the revision of the significance of the Theories operating with relativity of Time and absolute constant light speed, refusing the existence of the Ether. Besides the widely used, derived terminology of “*Optical Path Difference*”, author suggests to use — as for the future — the equivalent, directly measurable “*Optical Distance*”, and finally, also the “*Optical Distance Difference*” because it describes much better the real physical events going on in the Michelson-Morley experiment.