

Abstract Submitted  
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**On the the optical path length in various media** JAVIER HASBUN,  
University of West Georgia — As light travels through a substance, the path it follows is a stationary path known as the optical path length (OPL) and Fermat's principle leads to Snell's law as well as the law of reflection. It is possible to apply the variational principle [1] to obtain an Euler equation for the OPL. For a two layer media an analytic expression can be obtained that agrees with Snell's law. The concept is applied to more general media by solving the resulting Euler differential equation numerically. A Monte Carlo simulation method [2] modified for the present systems is applied for comparison with the numerical results obtained by solving the OPL Euler equation. The approaches presented here are beneficial to enhance the understanding of light behavior in an undergraduate optics physics course. [1] "Mathematical Methods in the Physical Sciences," 2nd. Ed., M L. Boas (J. Wiley, NY, 1983). [2] "An Introduction to Computer Simulation Methods" 2nd. Ed, H. Gould and J. Tobochnik (Addison Wesley, Reading MA, 1996)

Javier Hasbun  
University of West Georgia

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