Baylor University
PHYSICS

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Computing Highly Oscillatory Waves Faster and More Accurate

As we have seen in many electromagnetic or optical wave computations, faster and more accurate evaluations of highly oscillating integrals have become a challenge with an overarching importance and are widely perceived as an extremely difficult issue in simulation applications. In fact, a successful numerical method must base on an appropriate discretization which overcomes the oscillation. Once the dynamics of a computational strategy is designed and fully understood, the problem of highly oscillatory quadratures can become relatively simple and that the precision of calculations may even increase as the frequency of oscillation grows.

This talk will focus at a monochromatic laser traveling in a linear medium with refractive index that varies slowly on the scale of an optical wavelength. Several interesting computational methods will be introduced and discussed for evaluating targeted highly oscillatory beam integrals. Some computer simulation results will be presented.

Wednesday, January 26, 2011
4:00 p.m.
Room E.125, Baylor Sciences Building
Reception at 3:40 p.m. in BSB D.311
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