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**Colton James Willig\*** ([willig@live.unc.edu](mailto:willig@live.unc.edu)), 100 Melville Loop, Apt. 13, Chapel Hill, NC 27514. *Nonlinear Geometric Optics for Reflecting and Evanescent Pulses*. Preliminary report.

Weakly nonlinear geometric optics expansions of highly oscillatory reflecting and evanescent pulses are considered for a general class of differential operators. Through rigorous error analysis one can demonstrate that the leading term in these expansions is suitably close to the uniquely determined exact solution. The pulses considered reflect off fixed non characteristic boundaries in a spectrally stable way (introduced by Kreiss); some of which rapidly dissipate as they pass into the interior. The results in this paper provide a generalization to the work of Coulombel and Williams in "Nonlinear geometric optics for reflecting uniformly stable pulses" (J. Differential Equations 255), as the boundary frequency is considered not only in the hyperbolic region, but also in the mixed and elliptic region. Furthermore the boundary data considered in this paper is more general; it need not decay as strongly as the boundary data considered in Coulombel and William's paper. (Received September 16, 2014)