We consider Friedlander’s wave equation in two space dimensions in the half-space $x > 0$ with the boundary condition $u(x,y,t) = 0$ when $x = 0$. For a Gaussian beam $w(x,y,t;k)$ concentrated on a ray path that is tangent to $x = 0$ at $(x,y,t) = (0,0,0)$ we calculate the "reflected" wave $z(x,y,t;k)$ in $t > 0$ such that $w(x,y,t;k) + z(x,y,t;k)$ satisfies Friedlander’s wave equation and vanishes on $x = 0$. These computations are done to leading order in $k$ on the ray path.

The interaction of beams with boundaries has been studied for non-tangential beams and for beams gliding along the boundary. We undertook this calculation to see how a beam would change after it "grazed" a boundary." (Received February 08, 2017)