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Acousto-optics, the study of the interaction of sound and light waves, provides tools for the control of laser light. Sound waves propagated through columns of material change the index of refraction of the material. Laser light directed through the material is then diffracted allowing for both deflection and modulation of the beam. Proper choice of incident angle for the input laser light, the Bragg angle, results in 90% of the incident power diverted into the first diffracted order. Both analytic and computational methods are used to study the system of differential equations which describe this diffraction for arbitrary boundary conditions. (Received September 16, 2008)