

“ACOUSTIC WAVES GENERATED BY IMPULSIVE DISTURBANCES IN A
GRAVITATIONALLY STRATIFIED MEDIUM”

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There are two well-known oscillations detected from the sun: the five-minute oscillation period attributed to global pressure modes (or “p-modes”) in the solar interior, and the lesser-known three-minute oscillations in the chromosphere. Like the interior p-modes, the chromospheric oscillations are thought to be standing oscillations, waves that are trapped between two nodes from which they reflect. In this case, the photosphere and the transition region (TR) between the chromosphere and corona would be such reflecting nodes. However, signatures of these oscillations have been detected in the low corona, indicating that they are able to propagate through the TR. In this study, the authors investigate an alternative explanation to the idea that the cutoff frequency at the temperature minimum can explain the three-minute oscillations, since it doesn’t explain why frequencies just above the cutoff are largely evanescent. They suggest that the medium through which the waves are travelling manifests its response to some type of excitation in the form of the waves that are then observed. This excitation would have to be a continuous supply of energy and have the result that $k \ll \omega_0/C_s$ (where k is the wavenumber, ω_0 is the cutoff oscillation frequency, and C_s is the sound speed), which gives frequencies around the cutoff.