A Possible Atmospheric Wave from the Total and Annular Solar Eclipse over India

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We made an attempt to detect the eclipse induced atmospheric gravity waves during the total solar eclipse of 22 July 2009 and annular solar eclipse of 15 Jan 2010. The attempt was made by means of single microbarograph located at ground on the almost center line of the eclipse at Dibrugarh (for 22 July 2009) and Tiirunelveli (for 15 Jan 2010). Hines (1960) has proposed that atmospheric gravity waves are an important means by which energy may be transported vertically into the atmosphere. The importance of a total solar eclipse is that during such an event the input driving the wave is completely well known, being comprised of the atmospheric cooling induced by the moon shadow. Since the moon's shadow can move across the atmosphere supersonically, a bow wave can form in which the atmospheric gravity waves are enhanced. The enhancement in the pressure variation as well as amplitude of the gravity wave has been observed during the total solar eclipse of 22 July 2009. The atmospheric gravity waves of period 101 minute has been found to be produced on eclipse day. We have observed the annular solar eclipse over Tirunelveli on 15 Jan 2010. The surface pressure variation shows similar to the solar terminator variation.