

INTERNAL GRAVITY WAVES AND THEIR ROLE IN THE ENERGETICS OF THE SOLAR ATMOSPHERE

Th. Straus¹, B. Fleck², S. Jefferies³, S. McIntosh⁴, G. Severino¹,
and M. Steffen⁵

¹*INAF / Osservatorio Astronomico di Capodimonte, Napoli, Italy;*

²*ESA, Research and Scientific Support Department, NASA/GSFC,
Greenbelt, MD USA;*

³*Institute for Astronomy, University of Hawaii, Kula, HI USA;*

⁴*Southwest Research Institute, Boulder, CO USA;*

⁵*Astrophysikalisches Institut, Potsdam, Germany*

We revisit the dynamics and energetics of the solar atmosphere with the help of 3D numerical simulations of the overshoot region of compressible convection into the stable photosphere. We demonstrate the presence of internal gravity waves and estimate their contribution to the energy balance in the photosphere and low chromosphere. Internal gravity waves are found to be the dominant phenomenon in the quiet middle/upper photosphere at low frequencies (< 2.5 mHz) and to transport a significant amount of mechanical energy into the atmosphere outweighing the contribution of high-frequency (> 5 mHz) acoustic waves. We compare our results with observations.