

# Re: Solar absorption lines

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Scott wrote:

Hi all,

What process causes absorption lines in solar spectra (when measured from above the Earth's atmosphere)?

I understand how absorption lines can occur in *\_extra\_*-solar spectra due to an intervening cloud of interstellar gas/dust. The atoms in the cloud can absorb part of the (effectively blackbody) continuum (depending on the energy level of its electrons) & then re-emit it in a random direction, away from the observer.

However, in the case of the Sun [1] the "cloud" (actually the upper atmosphere of the Sun) completely surrounds the Sun so the *\_net\_* effect of scattering is zero – for any photon heading toward an observer that is scattered *\_away\_*, there is another photon heading away from the observer that is scattered *\_toward\_* them, statistically speaking.

Well, the point is that the radiation field in the solar atmosphere *\*isn't\** isotropic (as you seem to be suggesting), so the net effect of scattering is not zero (after all, the radiation has a net propagation direction *\*away\** from the sun).

Thomas