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The Clouds' Twilight Zone in the Longwave and its potential radiative effect

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Clouds are dominant players in the earth energy budget since they cover great part of the sky and interact both with short and longwave radiation. The estimation of clouds' net radiative effect demands a clear knowledge of their coverage and optical properties. Both aspects were shown to be ill defined, as large portion of the so-called clear sky have a unique signal that is not of cloudy nor cloud-free sky. So far the optical properties of this zone were explored only in the shortwave. Here we observe and analyze the clouds' twilight zone in the longwave infrared (LWT). More specifically, we analyze warm cumulus cloud fields and estimate the lower bound of the LWT effect to be 0.9 W/m2, which is equivalent to the addition of $\sim$100 ppm of CO_2 to the atmosphere. We show that this longwave twilight zone is likely to occupy great part of the "cloud-free" sky. Moreover, we show that this zone is likely to cause errors in other remotely sensed variables.