

# Nomenclature

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ASR	$A$	Absorbed solar radiation (energy from the Sun that is not reflected)
	$A_{\text{NF}}$	No-feedbacks ASR (the part of ASR not affected by feedbacks)
CO <sub>2</sub>	$C$	Carbon dioxide ( $C$ is the atmospheric concentration, ~400 ppm)
CO2EL		Carbon dioxide emission layer (average height of optical top of CO <sub>2</sub> )
	$D_{\text{R,2X}}$	Decrease in OLR per doubling of CO <sub>2</sub> (all else held constant), ~3.7 W/m <sup>2</sup>
ECS		Equilibrium climate sensitivity (the increase in $T_s$ when CO <sub>2</sub> doubles)
EDA		Externally-driven albedo (albedo independent of surface warming)
	$f$	Total feedbacks, ~1.7 W/m <sup>2</sup> per °C
	$G$	Net TOA downward flux (ASR less OLR, ~0 W/m <sup>2</sup> )
GCM		General circulation model
	$\Delta I$	Radiation imbalance (sum of all forcings)
	$L$	Base-2 logarithm of the CO <sub>2</sub> concentration $C$ ( $\Delta L = 1$ for a CO <sub>2</sub> doubling)
OLR	$R$	Outgoing longwave radiation (radiated energy/heat from Earth, ~239 W/m <sup>2</sup> )
TOA		Top of (the) atmosphere
TSI	$S$	Total solar irradiance (average yearly energy/heat from the Sun, incident on Earth, ~1,361 W/m <sup>2</sup> )
SBS	$\lambda_{\text{SB}}$	Stefan-Boltzmann sensitivity (slope of the Stefan-Boltzmann curve where the Earth is, ~0.267 °C per W/m <sup>2</sup> , see post 8)
	$T_{\text{R}}$	Radiating temperature (temperature that satisfies the Stefan Boltzmann equation applied to Earth, ~255 K, see post 8)
	$T_s$	Surface temperature (global average air temperature at the surface, ~288 K)
WVEL		Water vapor emission layer (average height of optical top of water vapor)
	$\lambda_0$	Planck sensitivity (reciprocal of the Planck feedback, which is sometimes also represented by $\lambda_0$ and which is not a feedback), ~0.31 °C per W/m <sup>2</sup>

Planck conditions (the conditions under which the Planck feedback or sensitivity applies): All else besides tropospheric temperatures and OLR are held constant—so there are no feedbacks, all tropospheric temperatures (including the surface temperature) change in unison, and stratospheric temperatures are unchanged (Soden & Held, 2006, pp. 3355-56). There are some arbitrary choices to be made, such as whether it is the specific or the relative humidities that remain unchanged as the troposphere warms, or what happens at the tropopause.