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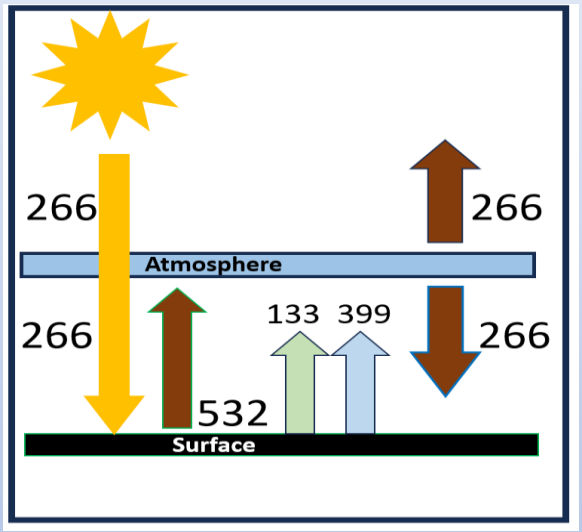
Trenberth's Greenhouse Geometry

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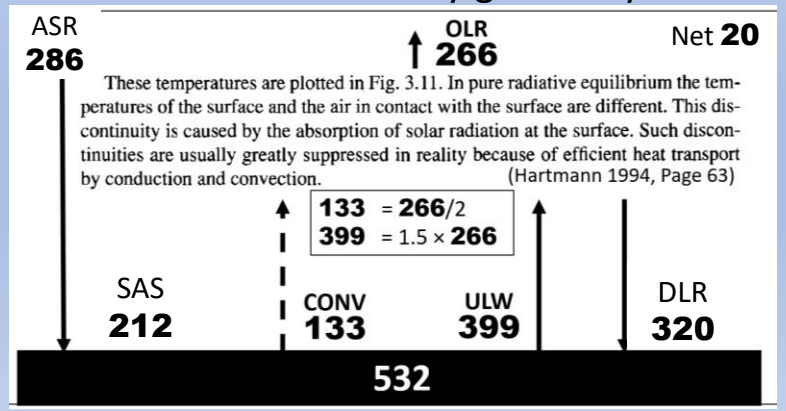
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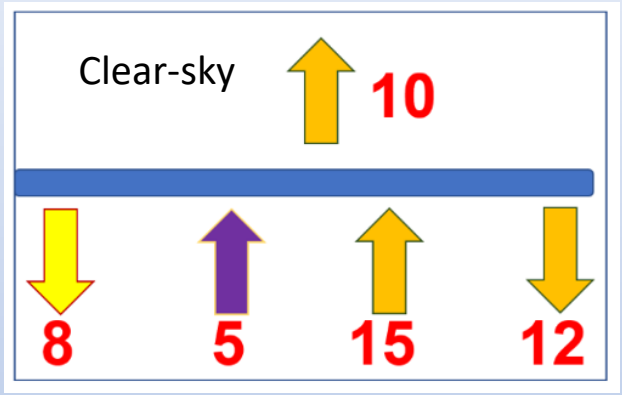


Trenberth's Earth-like geometry:



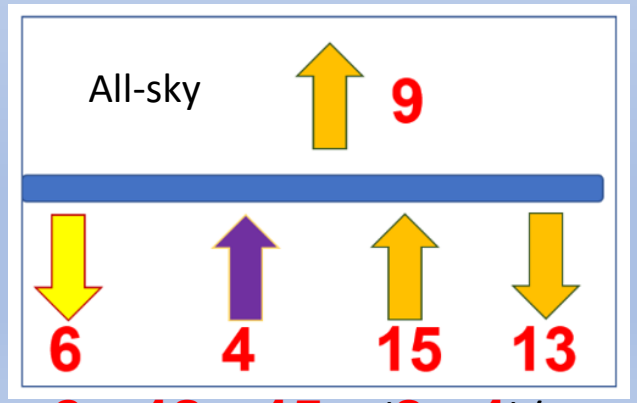
Real Earth's clear-sky geometry





$8 + 12 - 15 = 10/2$

$8 + 12 = 10 \times 2$



$6 + 13 - 15 = (9 - 1)/2$

$6 + 13 = 9 \times 2 + 1$

Clear-sky

Table 2-1. Geometry vs CERES observation for global mean clear-sky fluxes
CERES EBAF Edition 4.2, version 2, October 2000 - September 2023 (W m^{-2}), clear-sky

Eq. (1) SFC SW+LW Net = OLR/2 **8 + 12 – 15 = 10**/2 (Schw 1906, Eq.11; Houghton 1977, Eq. 2.13)
Eq. (2) SFC SW+LW Tot = 2OLR **8 + 12** = 2 × **10** (Schw 1906, Eq.11; Houghton 1977, Eq. 2.15 at τ = 2)

Unit = 1 = 26.68 Wm^{-2}	Clear-sky	N	N × Unit	EBAF Ed4.2	Difference
Clear-Sky TOA	SW insolation	51/4	340.17	340.20	0.03
	LW	40/4	266.80	265.95	-0.85
	SW	8/4	53.36	53.78	0.42
	Net	3/4	20.01	20.42	0.41
Clear-sky Surface	LW down	12	320.16	318.06	-2.10
	LW up	15	400.20	398.75	-1.45
	LW Net	-3	-80.04	-80.69	-0.65
	SW Net	8	213.44	211.33	-2.11
	SW + LW Net	5	133.40	130.64	-2.76

All-sky

Table 4-1. Geometry vs observation for global mean TOA and surface fluxes and CREs for
CERES EBAF Edition 4.2 V2 for October 2000 to September 2023 (W m^{-2}), all-sky, **1** = 26.68 Wm^{-2}

Eq. (3) SFC SW+LW Net = (OLR – LWCRE)/2 **6 + 13 – 15 = (9 – 1)**/2 (Schw 1906, Eq.11; Houghton 1977, Eq. 2.13 incl L)
Eq. (4) SFC SW+LW Tot = 2OLR + LWCRE **6 + 13** = 2 × **9 + 1** (Schw 1906, Eq.11; Houghton 1977, Eq. 2.15 at τ = 2 inc

TSI = 51	All-sky	N	N × Unit	EBAF Ed4.2	Diff
TOA	SW insolation	51/4	340.17	340.20	0.03
	SW up	15/4	100.05	98.95	-1.10
	LW up	36/4	240.12	240.37	0.25
	TOT Net	0	0	0.88	0.88
Surface	SW Net	6	160.08	163.71	3.63
	LW down	13	346.84	346.25	-0.59
	LW up	15	400.20	398.58	-1.62
	LW Net	-2	-53.36	-52.33	1.03
	TOT Net	4	106.72	111.38	4.66
	CRE				
TOA	SW	-7/4	-46.69	-45.17	1.52
	LW	1	26.68	25.58	-1.10
	Net	-3/4	-20.01	-19.59	0.42

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