

Supplement S1

July 12, 2022

1 Budyko Equations

$$E = E_p P (E_p^n + P^n)^{-\frac{1}{n}}$$

To express E/E_p as a function of P/E_p , we will divide both sides by E_p , then again divide the nominator and denominator of the right hand side by E_p and substitute P/E_p for P/E_p to obtain:

$$E/E_p = P/E_p (P/E_p^n + 1)^{-\frac{1}{n}}$$

Proof that multiplication of eq_EEp_Rod1 by E_p recovers eq_E_Rod1:

True

Similarly, to express E/P as a function of E_p/P , we will divide both sides of eq_E_Rod1 by P , then again divide the nominator and denominator of the right hand side by P and substitute E_p/P for E_p/P to obtain:

$$E/P = E_p/P (E_p/P^n + 1)^{-\frac{1}{n}}$$

True

$$E = E_p + P - (E_p^\omega + P^\omega)^{\frac{1}{\omega}}$$

$$E/P = E_p/P - (E_p/P^\omega + 1)^{\frac{1}{\omega}} + 1$$

True

$$E/E_p = P/E_p - (P/E_p^\omega + 1)^{\frac{1}{\omega}} + 1$$

True