$F_\lambda = F_\nu\left(\frac{c}{\lambda^2}\right)$ (1) $m_\lambda = -2.5\log F_\lambda + 2.5\log F_{0,\lambda}$

$F_\nu = F_\lambda\left(\frac{\lambda^2}{c}\right)$ (2) $m_\nu = -2.5\log F_\nu + 2.5\log F_{0,\nu}$

Need to eliminate F from one of these and replace with m. Solving (1) for F_λ:

$$2.5\log F_\lambda = 2.5\log F_{0,\lambda} - m_\lambda$$
$$\log F_\lambda = \log F_{0,\lambda} - 0.4\, m_\lambda$$
$$F_\lambda = 10^{\log F_{0,\lambda} - 0.4 m_\lambda}$$
$$F_\lambda = F_{0,\lambda}\, 10^{-0.4 m_\lambda}$$

$$m_\nu = -2.5\log F_\nu + 2.5\log F_{0,\nu} = -2.5\log\left(F_\lambda\frac{\lambda^2}{c}\right) + 2.5\log F_{0,\nu}$$

$$m_\nu = -2.5\log F_\lambda - 2.5\log\frac{\lambda^2}{c} + 2.5\log F_{0,\nu}$$

$$m_\nu = -2.5\log\left(F_{0,\lambda}10^{-0.4m_\lambda}\right) - 2.5\log\frac{\lambda^2}{c} + 2.5\log F_{0,\nu}$$

$$m_\nu = -2.5\left(\log F_{0,\lambda} - 0.4m_\lambda\right) - 2.5\log\frac{\lambda^2}{c} + 2.5\log F_{0,\nu}$$

$$m_\nu = m_\lambda - 2.5\log\frac{\lambda^2}{c} + 2.5\log F_{0,\nu} - 2.5\log F_{0,\lambda}$$

$$m_\nu = m_\lambda - 2.5\log\frac{\lambda^2}{c} + 2.5\log\frac{F_{0,\nu}}{F_{0,\lambda}}$$

This is the relation between m_ν/m_{ABNU} and m_λ/m_{STMAG}. It can be simplified by inserting constants:

$c = 3\times10^{18}$ Å s^{-1}, $F_{0,\lambda} = 3.6\times10^{-9}$ erg cm^{-2} s^{-1} Å^{-1}

$F_{0,\nu} = 3.63\times10^{-20}$ erg cm^{-2} s^{-1} Hz^{-1}

$$m_\nu = m_\lambda - 5\log\lambda + 2.5\log c - 27.5$$

★ $m_\nu = m_\lambda - 5\log\lambda + 18.7$ Indeed, $m_\lambda \cong m_\nu$ at 5500Å.

★ $m_\lambda = m_\nu + 5\log\lambda - 18.7$