DERIVATION OF EQUATION 3

From equation 1 in the text it holds:

$$b_{abs}(\lambda) = \; = \underbrace{\left[(BC_{FF} + BC_{WB}) \cdot \sigma_0^{BC}\right]}_{A} \lambda^{-\alpha_{BC}} + \underbrace{\left[BrC \cdot \sigma_0^{BrC}\right]}_{B} \lambda^{-\alpha_{BrC}} =$$

$$\left[(BC_{FF} + BC_{WB}) \cdot MAC_{\lambda ref1}^{BC}\right]\left(\frac{\lambda}{\lambda_{ref1}}\right)^{-\alpha_{BC}} + \left[BrC \cdot MAC_{\lambda ref2}^{BrC}\right]\left(\frac{\lambda}{\lambda_{ref2}}\right)^{-\alpha_{BrC}}$$

where $\sigma_0^{BC} = \frac{MAC_{\lambda ref1}^{BC}}{\lambda_{ref1}^{-\alpha_{BC}}}$ and $\sigma_0^{BrC} = \frac{MAC_{\lambda ref2}^{BrC}}{\lambda_{ref2}^{-\alpha_{BrC}}}$ only depend on BC and BrC properties. $MAC\,_{\lambda ref1}^{BC}$ and $MAC\,_{\lambda ref2}^{BC}$ are mass specific absorption coefficients (in m^2g^{-1}) at chosen reference wavelengths (λ_{ref1} and λ_{ref2}) for BC and BrC, called respectively.

From equation 2, it holds

$$b_{abs}(\lambda) = \underbrace{\left[BC_{FF} \cdot \sigma_0^{BC}\right]}_{A'}(\lambda)^{-\alpha_{FF}} + \underbrace{\left[BC_{WB} \cdot \sigma_0^{BC} + BrC \cdot \sigma_0^{BrC}\right]}_{B'}(\lambda)^{-\alpha_{WB}} .$$

By comparison of the terms, eq. 3 is derived.