Perez All-Weather.

Relative luminance.

$$l_{\mathrm{v}} = f(\xi, \gamma) = [1 + a\exp(b/\cos\xi)] \cdot [1 + c\exp(d\gamma) + e\cos^2\gamma]. \tag{1}$$

Assumption.

$$b < 0. \tag{2}$$

Luminance at the zenith.

$$l_{\mathrm{v}}(0°, \gamma) = [1 + a\exp(b)] \cdot [1 + c\exp(d\gamma) + e\cos^2\gamma]. \tag{3}$$

Luminance at the horizon.

$$f(90°, \gamma) = 1 + c\exp(d\gamma) + e\cos^2\gamma. \tag{4}$$

Luminance of the sun.

$$f(\xi, 0°) = \left[1 + a\exp\left(\frac{b}{\cos}\xi\right)\right] \cdot [1 + c + e] \tag{5}$$

Luminance of the sun at the zenith.

$$f(0°, 0°) = [1 + a\exp(b)] \cdot [1 + c + e]. \tag{6}$$

Luminance of the sun at the horizon.

$$f(90°, 0°) = 1 + c + e. \tag{7}$$

Absolute luminance from absolute luminance at zenith.

$$L_{\mathrm{v}} = L_{\mathrm{vz}} f(\xi, \gamma) / f(0°, \gamma). \tag{8}$$

Absolute luminance from illuminance.

$$L_{\mathrm{v}} = l_{\mathrm{v}} E_{\mathrm{vd}} \left(\int_{\mathrm{sky}} [\mathrm{lv}(\xi, \gamma)\cos\xi] \mathrm{d}\omega \right)^{-1}. \tag{9}$$