$$= \frac{0.5 \text{ MPa}}{\cos(54.7°)\ \cos(45°)} = \frac{0.5 \text{ MPa}}{(0.578)(0.707)} = 1.22 \text{ MPa}$$

Now, we must determine the value of λ for the (111)–$[10\bar{1}]$ slip system—that is, the angle between the [100] and $[10\bar{1}]$ directions. Again using Equation 7.6

$$\lambda_{[100]-[10\bar{1}]} = \cos^{-1}\left[\frac{(1)(1) + (0)(0) + (0)(-1)}{\sqrt{\left[(1)^2 + (0)^2 + (0)^2\right]\left[(1)^2 + (0)^2 + (-1)^2\right]}}\right]$$

$$= \cos^{-1}\left(\frac{1}{\sqrt{2}}\right) = 45°$$

Thus, since the values of ϕ and λ for this (111)–$[10\bar{1}]$ slip system are the same as for (111)–$[1\bar{1}0]$, so also will σ_y be the same—viz 1.22 MPa.

And, finally, for the (111)–$[0\bar{1}1]$ slip system, λ is computed using Equation 7.6 as follows:

$$\lambda_{[100]-[0\bar{1}1]} = \cos^{-1}\left[\frac{(1)(0) + (0)(-1) + (0)(1)}{\sqrt{\left[(1)^2 + (0)^2 + (0)^2\right]\left[(0)^2 + (-1)^2 + (1)^2\right]}}\right]$$

$$= \cos^{-1}(0) = 90°$$

Thus, from Equation 7.4, the yield strength for this slip system is

$$\sigma_y = \frac{\tau_{crss}}{(\cos\phi\ \cos\lambda)}$$

$$= \frac{0.5 \text{ MPa}}{\cos(54.7°)\ \cos(90°)} = \frac{0.5 \text{ MPa}}{(0.578)(0)} = \infty$$

which means that slip will not occur on this (111)–$[0\bar{1}1]$ slip system.