OPHW2-4 Soln)

Here the air is the middle layer $(n_2 = 1)$, with glass being the top and bottom layer. Let's look for conditions of no reflection:

 $PC_{TOP} + PC_{BOTTOM} + 2n_2d = (m + \frac{1}{2})\lambda_o$

At the top surface of the air layer, the phase shift will be $0^{\circ}(n_2 \le n_1)$. At the bottom layer, it will be $180^{\circ}(n_3 \ge n_2)$.

 $0 + \lambda_o/2 + 2d = (m + 1/2)\lambda_o$

 $2d = m\lambda_o$

We see that where the glass slides touch, m = 0, d = 0, and we see no reflection.

The next thickness that results in no reflection is when m = 1:

 $2d = \lambda_o$ -> $d = \lambda_o/2 = 273 \text{ nm} = 2.73 \text{ x} 10^{-5} \text{ cm}$

This spot must be 1/15 of a cm (= 0.0667 cm) from the first spot. The tangent of the angle between the slides is then

 $tan\theta = 2.73 x 10^{-5} / 0.0667 = .00041$

So, $\theta = 0.023^{\circ}$.