Θοδωρή δίνω μια λύση ίσως όχι η ενδεδειγμένη

Από

$$\begin{pmatrix} \Delta\lambda = \lambda_C\left(1-\cos\varphi\right) \\ \lambda' = 2\lambda \end{pmatrix} \rightarrow \lambda = \lambda_C\left(1-\cos\varphi\right)$$

Από το σχήμα των ορμών που είναι ισοσκελές προκύπτει ότι $\theta = \pi - 2\varphi$

Συνδέω τις δύο γωνίες

$$\begin{pmatrix} \frac{h}{\lambda} = \frac{h}{\lambda'}\cos\varphi + \gamma m_e \upsilon \cos\theta \\ 0 = \frac{h}{\lambda'}\sin\varphi - \gamma m_e \upsilon \sin\theta \end{pmatrix} \rightarrow \begin{pmatrix} \gamma m_e \upsilon \cos\theta = h\left(\frac{1}{\lambda} - \frac{1}{\lambda'}\cos\varphi\right) \\ \gamma m_e \upsilon \sin\theta = \frac{h}{\lambda'}\sin\varphi \end{pmatrix} \rightarrow$$

$$\tan\theta = \frac{\frac{1}{\lambda'}\sin\varphi}{\frac{1}{\lambda} - \frac{1}{\lambda'}\cos\varphi} = \frac{\frac{1}{\lambda'}\sin\varphi}{\frac{\lambda' - \lambda\cos\varphi}{\lambda\lambda'}} = \frac{\lambda\sin\varphi}{\lambda' - \lambda\cos\varphi} = \frac{\lambda\sin\varphi}{\lambda + \lambda_C\left(1-\cos\varphi\right) - \lambda\cos\varphi} =$$

$$\frac{\lambda\sin\varphi}{\lambda\left(1-\cos\varphi\right) + \lambda_C\left(1-\cos\varphi\right)} = \frac{\lambda}{\lambda+\lambda_C}\frac{\sin\varphi}{1-\cos\varphi} = \frac{\lambda}{\lambda+\lambda_C}\frac{2\sin\left(\varphi/2\right)\cos\left(\varphi/2\right)}{2\sin^2\left(\varphi/2\right)} = \frac{\lambda}{\lambda+\lambda_C}\cot\left(\varphi/2\right)$$

$$\tan\theta = \frac{\lambda}{\lambda+\lambda_C}\cot\left(\varphi/2\right) \quad \left[\alpha\nu\ \varphi\uparrow \Rightarrow \cot\left(\varphi/2\right)\downarrow \Rightarrow \tan\theta\downarrow \Rightarrow \theta\downarrow\right]\left(\alpha\nu\ \varphi = 0,\ \pi \rightarrow \theta = \pi/2,\ 0\right) \rightarrow$$

$$\tan\theta = \frac{\lambda}{\lambda+\lambda_C}\frac{\sin\varphi}{1-\cos\varphi} = \frac{\lambda_C\left(1-\cos\varphi\right)}{\lambda_C\left(1-\cos\varphi\right)+\lambda_C}\frac{\sin\varphi}{1-\cos\varphi} = \frac{\sin\varphi}{2-\cos\varphi}$$

$$\theta = \pi - 2\varphi \rightarrow \tan\theta = -\tan 2\varphi$$

$$-\frac{\sin 2\varphi}{\cos 2\varphi} = \frac{\sin\varphi}{2-\cos\varphi} \rightarrow \frac{2\sin\varphi\cos\varphi}{1-2\cos^2\varphi} = \frac{\sin\varphi}{2-\cos\varphi} \rightarrow 1-2\cos^2\varphi = 4\cos\varphi - 2\cos^2\varphi \rightarrow$$

$$\cos\varphi = \frac{1}{4}$$

Άρα

$$\lambda = \lambda_C\left(1-\cos\varphi\right) = \lambda_C\left(1-\frac{1}{4}\right) = \frac{3}{4}\times 2{,}43\ pm = 1{,}82\ pm$$