

Angular deviations of ray in radians

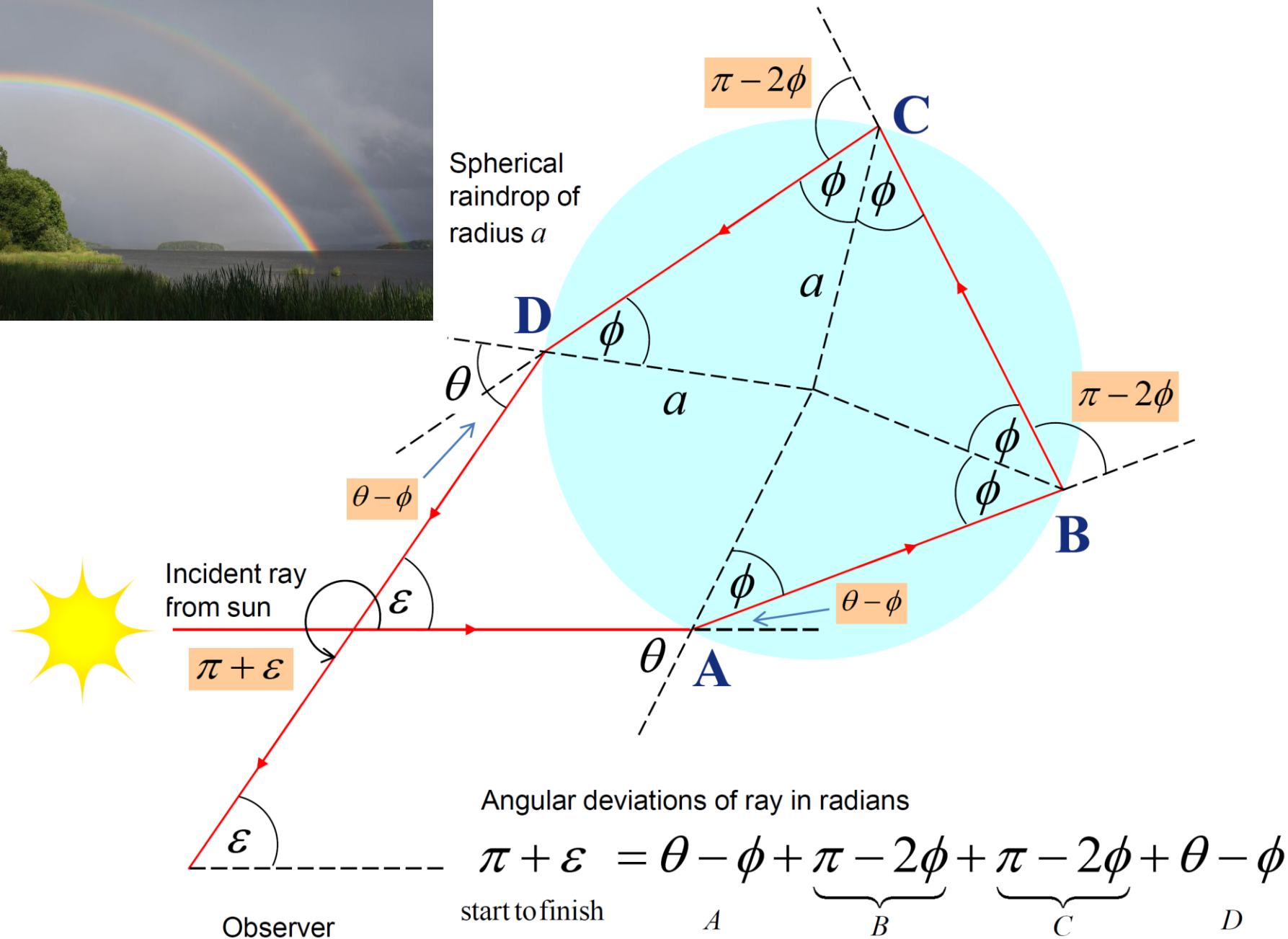
$$\pi - \epsilon = \theta - \phi + \underbrace{\pi - 2\phi}_B + \theta - \phi_C$$

start to finish

$$\therefore \epsilon = 4\phi - 2\theta$$



Spherical
raindrop of
radius a



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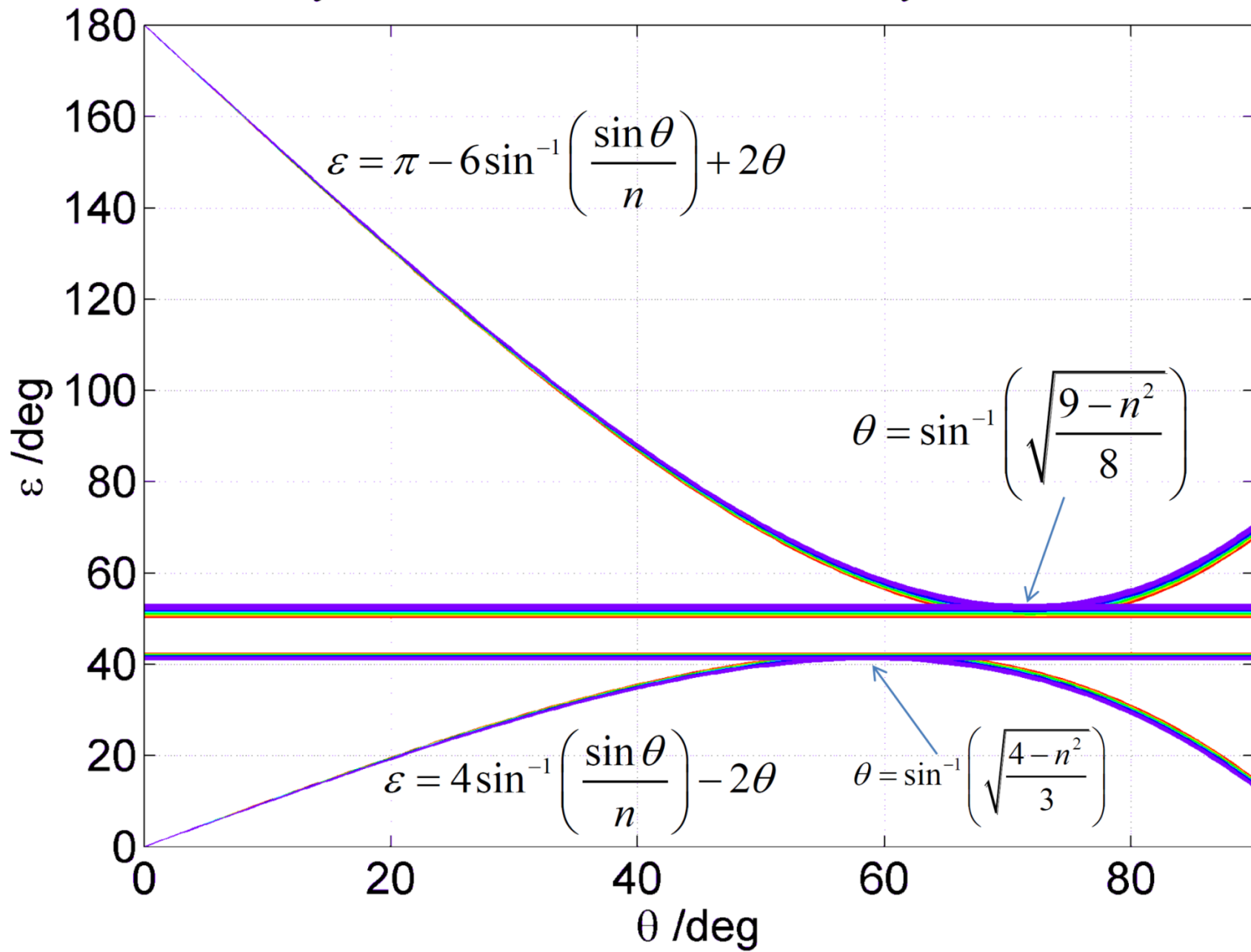
$$\pi + \varepsilon = \theta - \phi + \underbrace{\pi - 2\phi}_B + \underbrace{\pi - 2\phi}_C + \theta - \phi_D$$

start to finish A B C D

$$\therefore \varepsilon = \pi - 6\phi + 2\theta$$

Elevation of deflected beam /deg

Primary $\varepsilon=40.9^\circ$ to 42.5° , Secondary $\varepsilon=50.2^\circ$ to 53°



Elevation of single and double rainbows

