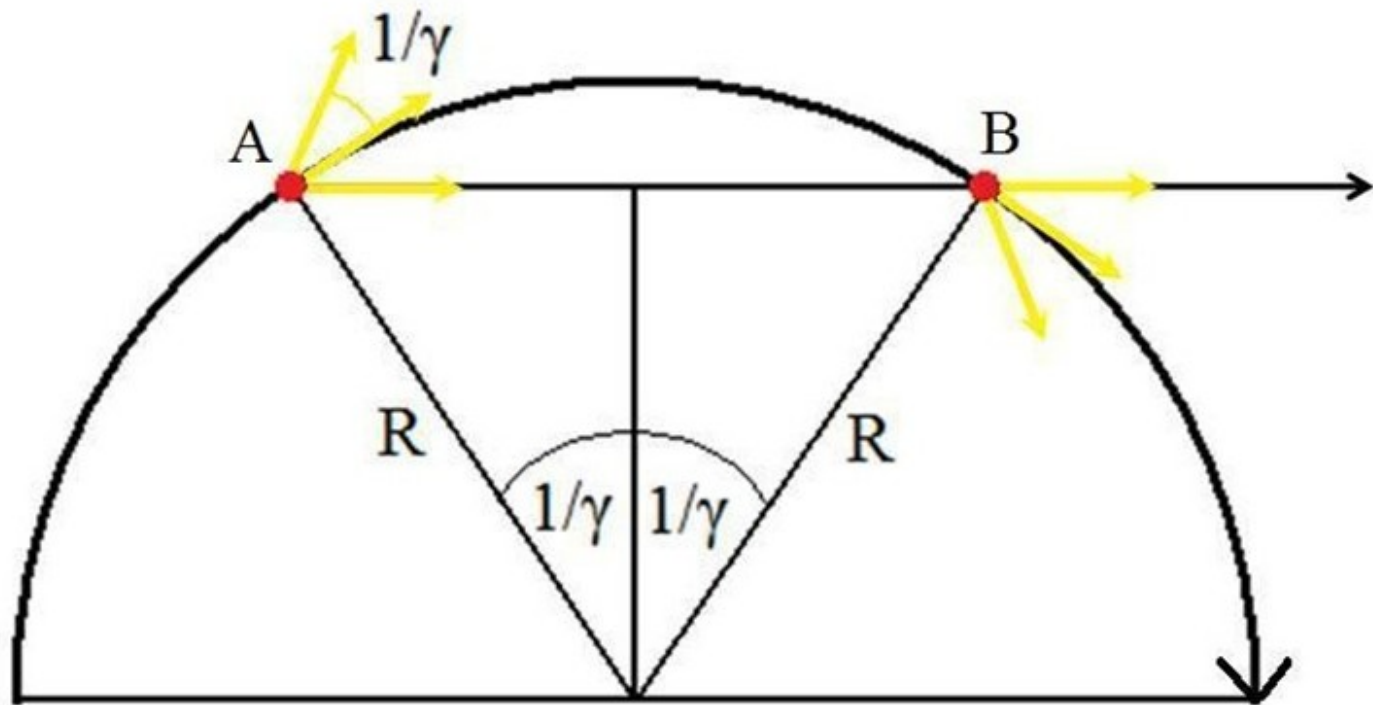


Délka záblesku a charakteristická frekvence synchrotronového záření

Petr Fatka

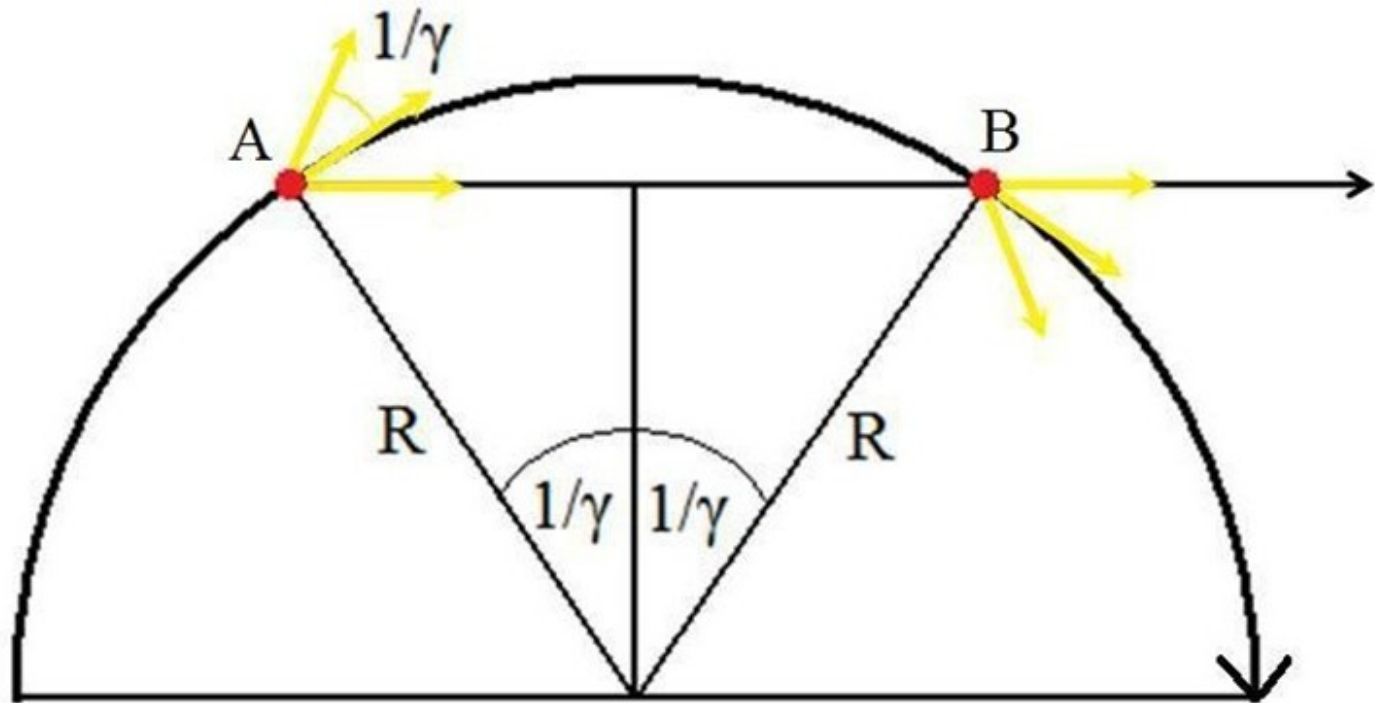
MU Brno 20.6.2012

Délka záblesku



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Délka záblesku = doba přejezdu elektronu obloukem – doba letu fotonu tětivou



Užitečné vztahy a hodnoty

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$$\frac{1}{\beta} = (1 - \gamma^{-2})^{-0.5} = 1 + \left(-\frac{1}{2}\right)(-\gamma^{-2}) = 1 + \frac{1}{2\gamma^2}$$

$$\omega_L = \frac{c}{R}$$

$$\sin\left(\frac{1}{\gamma}\right) = \frac{1}{\gamma} - \frac{\left(\frac{1}{\gamma}\right)^3}{6} = \frac{1}{\gamma} - \frac{1}{6\gamma^3}$$

Délka záblesku

Přejezd elektronu
obloukem

$$l = R\alpha = R\frac{2}{\gamma}$$

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$$\Delta t = \frac{2R}{c} \left(\frac{1}{\gamma} + \frac{1}{2\gamma^3} - \frac{1}{\gamma} + \frac{1}{6\gamma^3} \right) = \frac{2R}{c} \left(\frac{1}{2\gamma^3} + \frac{1}{6\gamma^3} \right) = \frac{4R}{3c\gamma^3}$$

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