SOLENSIM Model summary

Anton Douginets (anton.douginets@physik.hu-berlin.de)
Andrii Yanovets (yanoveta@hu-berlin.de)

June 27, 2020

Summary

This is a summarizing description of the physical model - i.e. axial field calculation, characteristic value determination from axial field, field integrals etc.

Contents

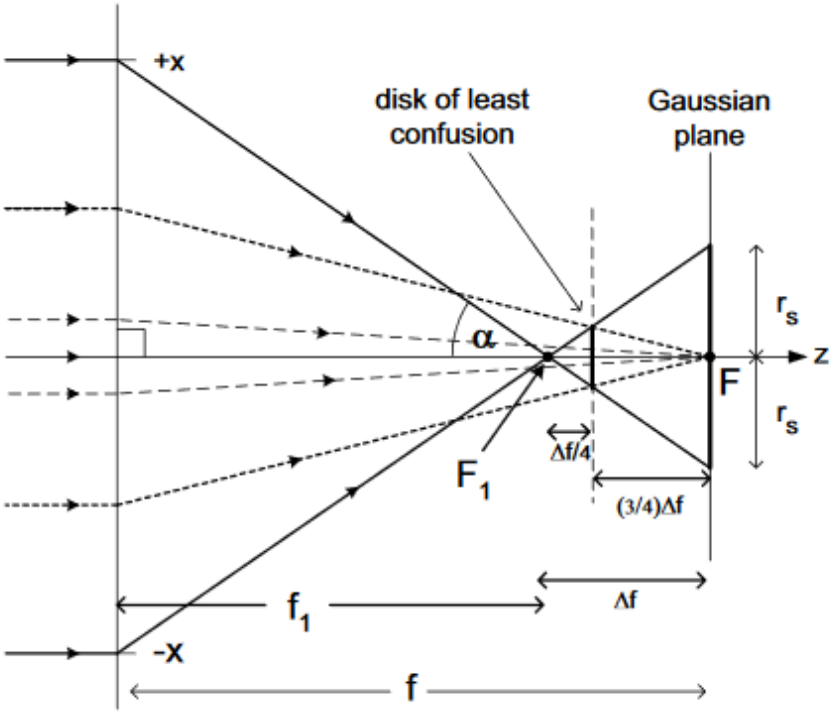

Figure 1: title

1 Chromatic aberrations and focal spot size

$$1/f = const. \cdot F2$$

$$\triangle f \simeq c \cdot x^2$$

$$x = f_1 tan\left(\alpha\right) \simeq f \cdot tan\left(\alpha\right)$$

$$r_s = \triangle f \cdot tan\left(\alpha\right) \simeq \triangle f \cdot \alpha \approx \left(c\left(f \cdot tan\left(\alpha\right)\right)^2\right) \cdot tan\left(\alpha\right) = C_s tan\left(\alpha\right)^3 = C_s \cdot \left(\frac{max\left\{x\right\}}{f - \triangle f}\right)^3$$

$$\underset{f \approx f_1}{=} C_s \cdot \left(\frac{max\left\{x\right\}}{f}\right)^3 \quad (1)$$

If $f \not\approx f_1$then replace f in (1) with $f - max\left\{x\right\}^2 \cdot \frac{C_s}{f^2}$