Hyperbolic Plots for Gaussian Paraxial Optics

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Abstract

The Gaussian thin lens equation is $\pm 1/u \pm 1/f = \pm 1/v$

LIMB A2 (v>u), the image is magni ed .Examples are macrophotography, the microscope objective and the lensometer at its endpoint, when the exit beam is parallel.

LIMB B1 (v>u) and u f, real objects from virtual images

An eye piece forms a magni ed virtual image of the real objective image. A1 combined with B1 is the astronomical telescope; A2 combined with B1 is the microscope. Other examples of limb B1 are hand magni ers, the direct ophthalmoscope, and the shaving mirror.

LIMB B2 (U>V) virtual objects form real images. Examples are hyperopic corrections; the correcting lens presents a converging beam to the eye which can then form a real im Gonclusion

is study presents a graphical representation of the reciprocal relationship between object and image location across the whole spectrum of focal lengths. Examples are drawn from engineering, photography and clinical optics.

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