

No Comma Talks

Material de Apoio

SE02EP02 – Aberrações Esféricas, Distorção e Curvatura de Campo

Aberrações Esféricas

Seguem abaixo alguns diagramas mostrando como se formam as aberrações esféricas, bem como os tipos mais comuns de elementos internos das lentes.

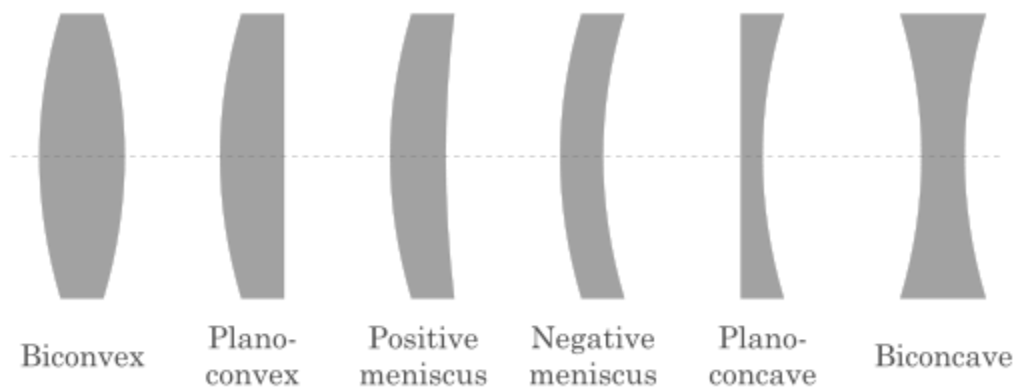


FIGURA 1 - TIPOS DE ELEMENTOS ESFÉRICOS

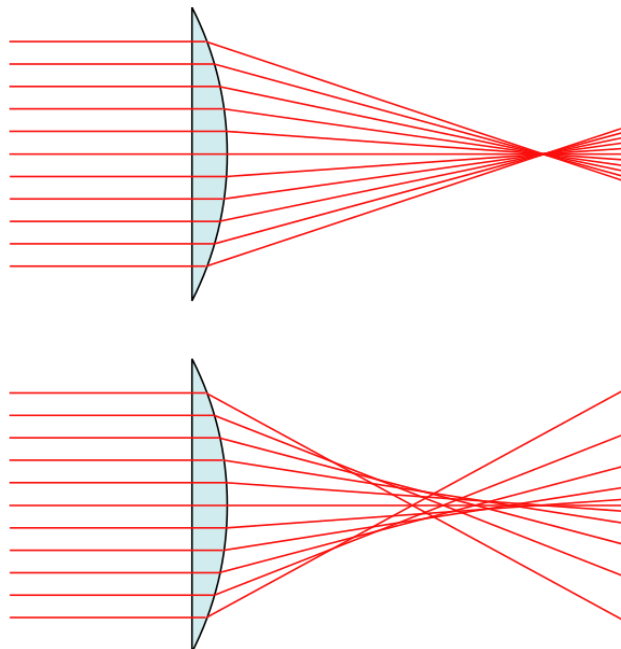


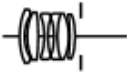
FIGURA 2 - EXEMPLO DELENTE PERFEITA (ACIMA) E FORMAÇÃO DE ABERRAÇÃO ESFÉRICA (ABAIXO)

Repare que na figura que mostra a aberração esférica (porção de baixo da figura 2) os raios de luz que passam pelo centro da lente convergem em ponto mais recuado em relação aos que convergem à partir das bordas. Dessa forma, com a lente toda aberta (número F grande) o foco fica mais à frente e à medida que fechamos o diafragma o ponto focal recua aos pontos de convergência do centro da lente, gerando o fenômeno de mudança de foco em função de aberrações esféricas.

Another twenty-six Double Gauss lenses, 1978-2010.



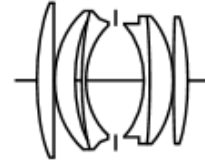
**Nippon Kogaku (Nikon)
Nikkor AI 50mm f/1.8
1978**



**Asahi Optical
Pentax-110 24mm f/2.8
1978**



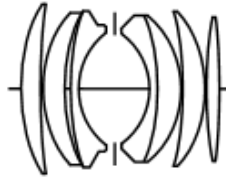
**Konishiroku (Konica)
Hexanon AR 40mm f/1.8
1979**



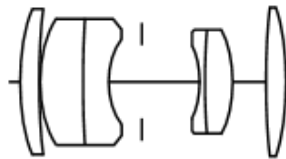
**Nippon Kogaku
Nikon Series E 50mm f/1.8
1979**



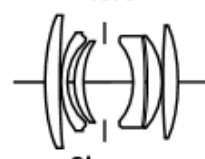
**Olympus
OM Zuiko Auto-S 50mm f/1.8
1979**



**Olympus
OM Zuiko Auto-S 50mm f/1.2
1982**



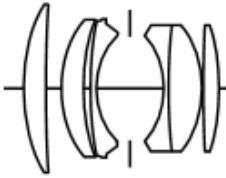
**Nippon Kogaku (Nikon)
AF Nikkor P 80mm f/2.8
1983**



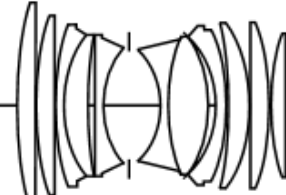
**Olympus
OM Zuiko Auto-S 40mm f/2
1983**



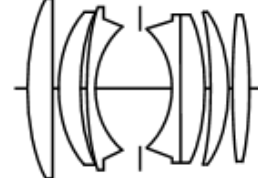
**Olympus
AF Zuiko 50mm f/1.8
1986**



**Canon (EOS)
EF 50mm f/1.8 (v1)
1987**



**Canon (EOS)
EF L USM 50mm f/1
1989**



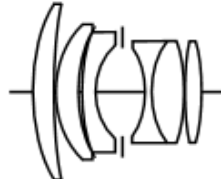
**Canon (EOS)
EF USM 50mm f/1.4
1993**



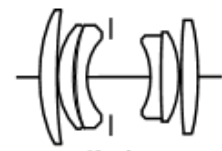
**Zeiss
Planar T* G 45mm f/2
1995**



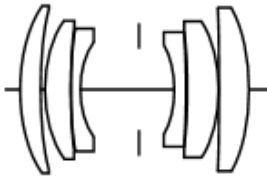
**Zeiss
Planar T* G 35mm f/2
1997**



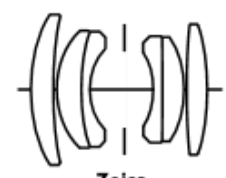
**(Cosina) Voigtlander
Nokton 50mm f/1.5 Aspherical
1999**



**Konica
M-Hexanon 50mm f/2
1999**



**(Fuji) Hasselblad
HC 80mm f/2.8
2002**



**Zeiss
Planar T* ZM 50mm f/2
2006**



**Canon (EOS)
EF L USM 50mm f/1.2
2007**



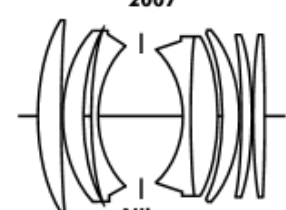
**(Cosina) Voigtlander
Nokton 35mm f/1.4
2008**



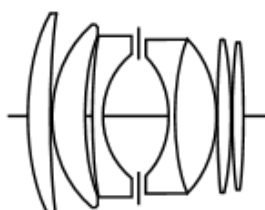
**Olympus
Zuiko Digital 25mm f/2.8
2008**



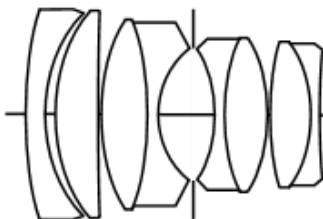
**Sigma
EX DG HSM 50mm f/1.4
2008**



**Nikon
AF-S Nikkor G 50mm f/1.4
2009**



**(Cosina) Voigtlander
Nokton 50mm f/1.1
2009**



**Leica
Noctilux-M 50mm f/0.95
2009**

**(Cosina) Voigtlander
(Micro Four Thirds)
Nokton 25mm f/0.95
2010**



Um diagrama mostrando a convergência focal de um elemento Asférico:

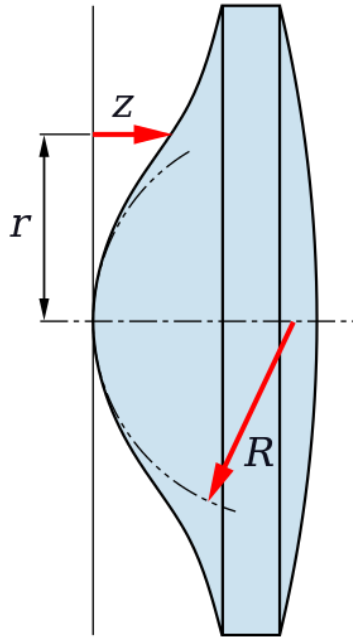


FIGURA 3 - ELEMENTO ASFÉRICO (REPRODUZIDO DA WIKIPEDIA)

Distorções

Seguem algumas imagens mostrando os tipos de distorção presentes nas lentes:

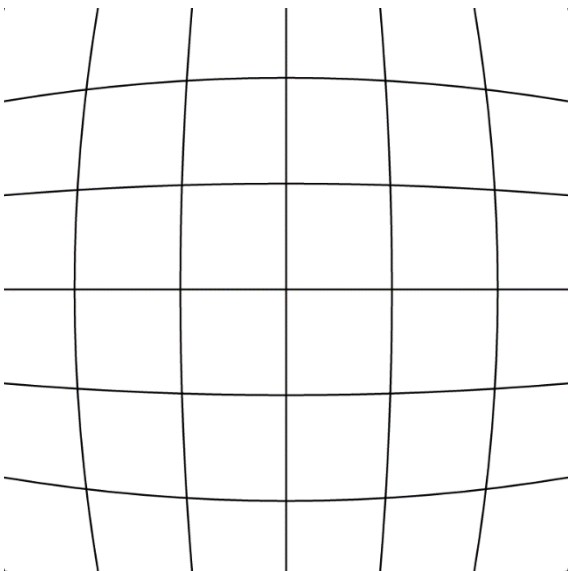


FIGURA 5 - DISTRORÇÃO EM BARRIL

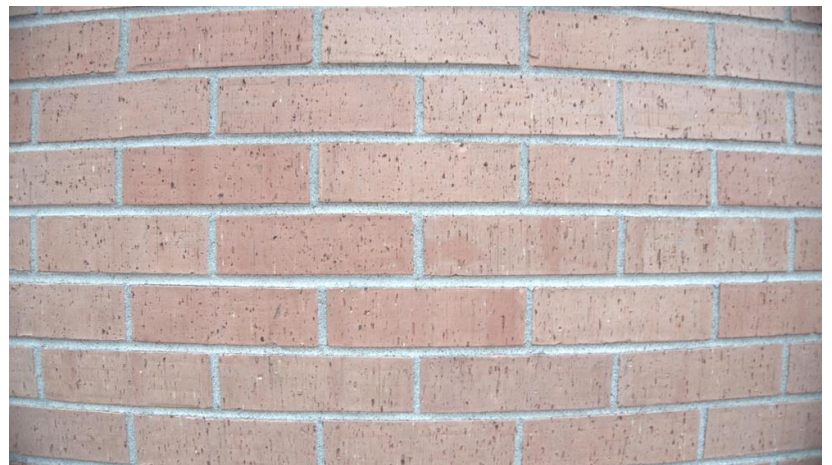


FIGURA 4 - DISTRORÇÃO EM BARRIL NA VIDA REAL

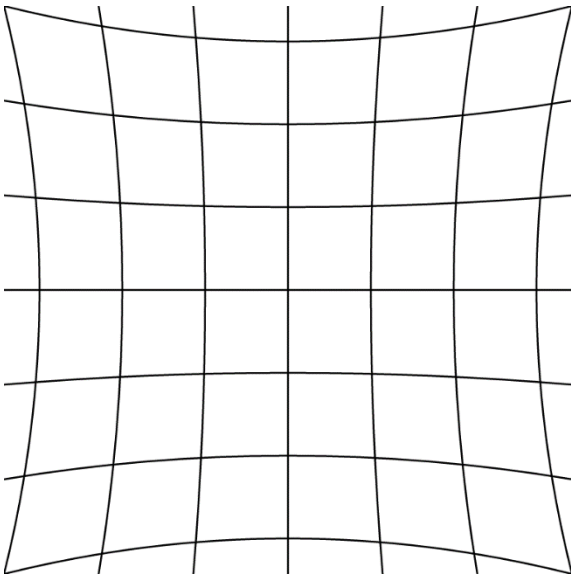


FIGURA 7 - DISTORÇÃO PINCUSHION

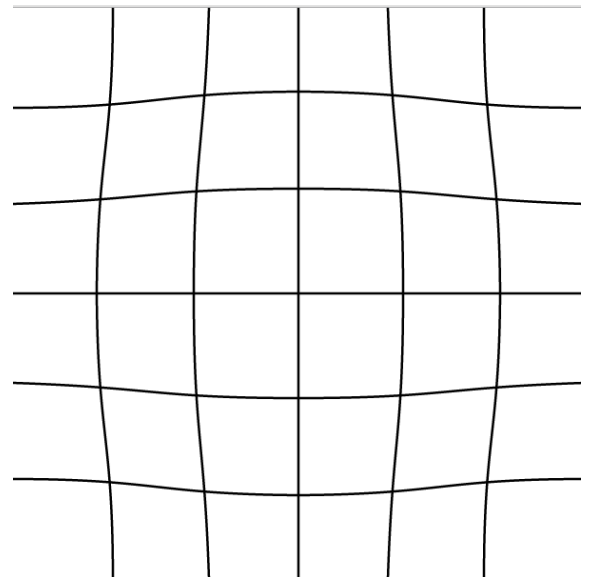


FIGURA 6 - DISTORÇÃO BIGODE

Curvatura de Campo

Seguem algumas imagens mostrando os efeitos da curvatura de campo.

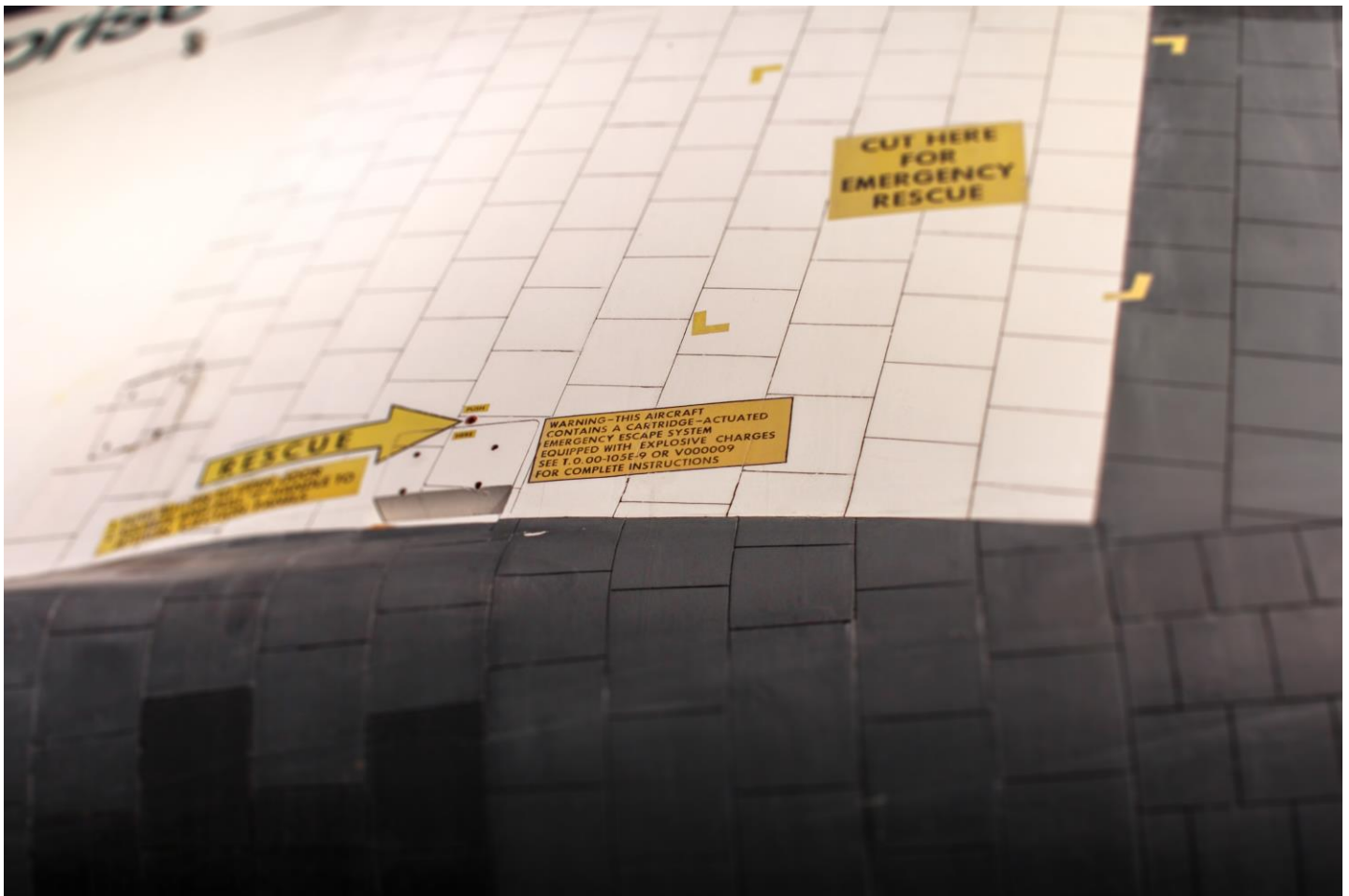


FIGURA 8 - IMAGEM SIMULANDO A CURVATURA DE CAMPO, COM A PERDA DE FOCO EM ELEMENTOS DO MESMO PLANO FOCAL

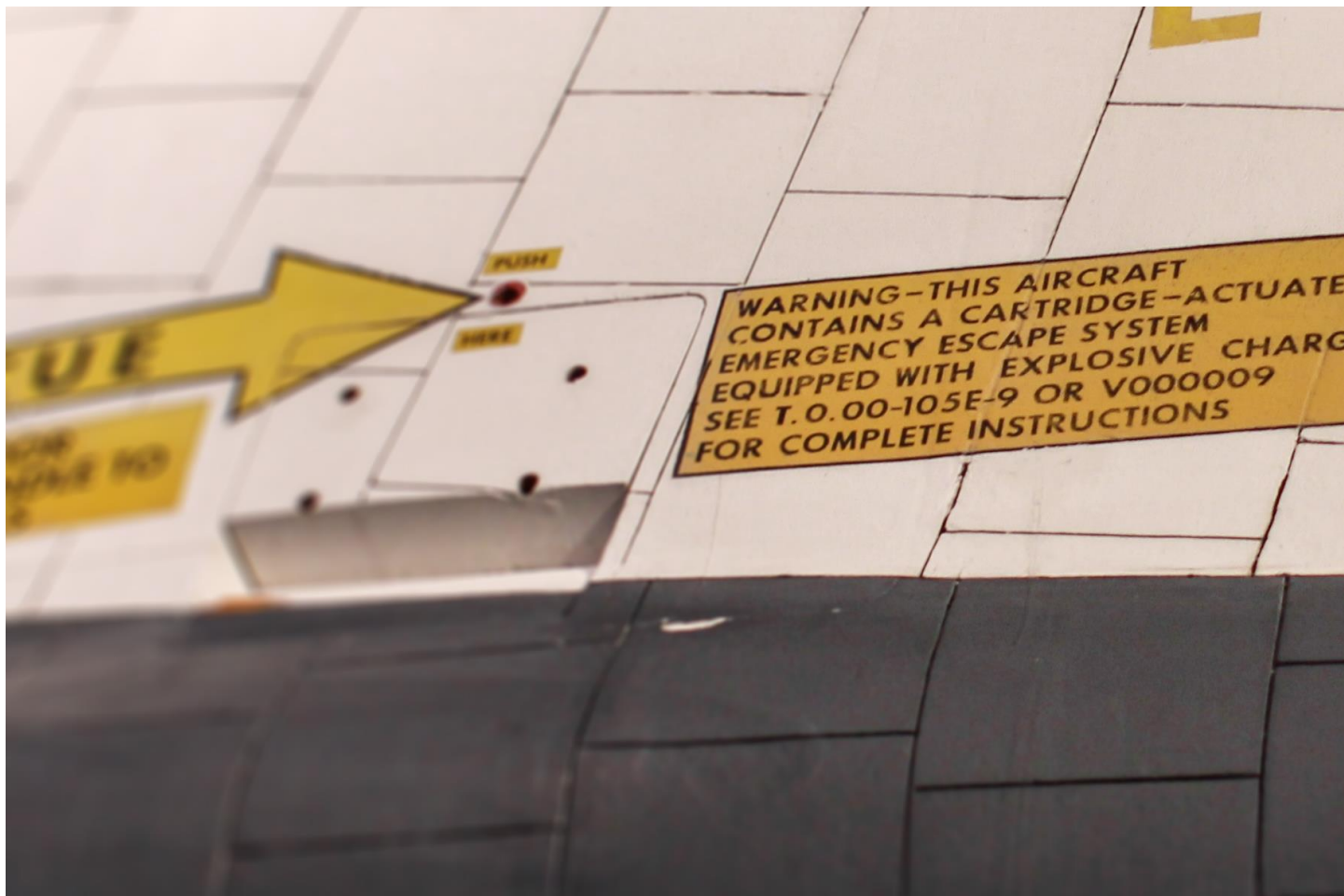


FIGURA 9 - DETALHE DA IMAGEM ANTERIOR