Title (en)

STRUCTURES AND METHODS FOR REDUCING ABERRATION IN OPTICAL SYSTEMS

Title (de)

STRUKTUREN UND VERFAHREN ZUR VERRINGERUNG DER ABERRATION IN OPTISCHEN SYSTEMEN

Title (fr)

STRUCTURES ET PROCEDES DE REDUCTION D'ABERRATION DANS DES SYSTEMES OPTIQUES

Publication

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Application

EP 02795578 A 20021030

Priority

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- US 33509301 P 20011030
- US 33218301 P 20011121
- US 36380802 P 20020312
- US 36791102 P 20020326
- US 38542702 P 20020531
- US 17860102 A 20020620
- US 17893702 A 20020620
- US 17862102 A 20020620
- US 17893502 A 20020620

Abstract (en)

[origin: WO03038479A2] An optical system includes multiple cubic crystalline optical elements and one or more polarization rotators in which the crystal lattices of the cubic crystalline optical elements are oriented with respect to each other to reduce the effects of intrinsic birefringence and produce a system with reduced retardance. The optical system may be a refractive or catadioptric system having a high numerical aperture and using light with a wavelength at or below 248 nanometers. The net retardance of the system is less than the sum of the retardance contributions of the respective optical elements. In one embodiment, all cubic crystalline optical elements are oriented with identical three dimensional cubic crystalline lattice directions, a 90 DEG polarization rotator divides the system into front and rear groups such that the net retardance of the front group is balanced by the net retardance of the rear group. The optical system may be used in a photolithography tool to pattern substrates such as semiconductor substrates and thereby produce semiconductor devices.

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Citation (search report)

- [X] US 6137626 A 20001024 - TAKAOKA HIDEYUKI [JP]
- [X] US 4918395 A 19900417 - DIFONZO JOHN C [US], et al
- [X] US 3052152 A 19620904 - KOESTER CHARLES J
- [A] BURNETT J H ET AL: "Intrinsic Birefringence in 157nm Materials", PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON 157NM LITHOGRAPHY, DANA POINT , CALIFORNIA, 15 May 2001 (2001-05-15), pages 1 - 13, XP002218849
- See references of WO 03038479A2

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