

SPICA-VIS CONCEPT DESIGN: INJECTION TABLE

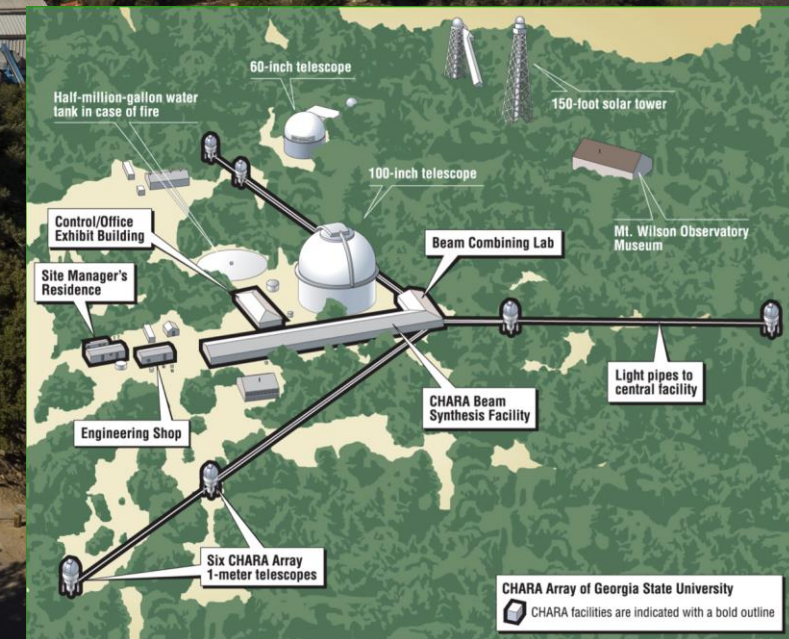
SPICA-VIS @ CHARA ARRAY

MAIN IMPUTS

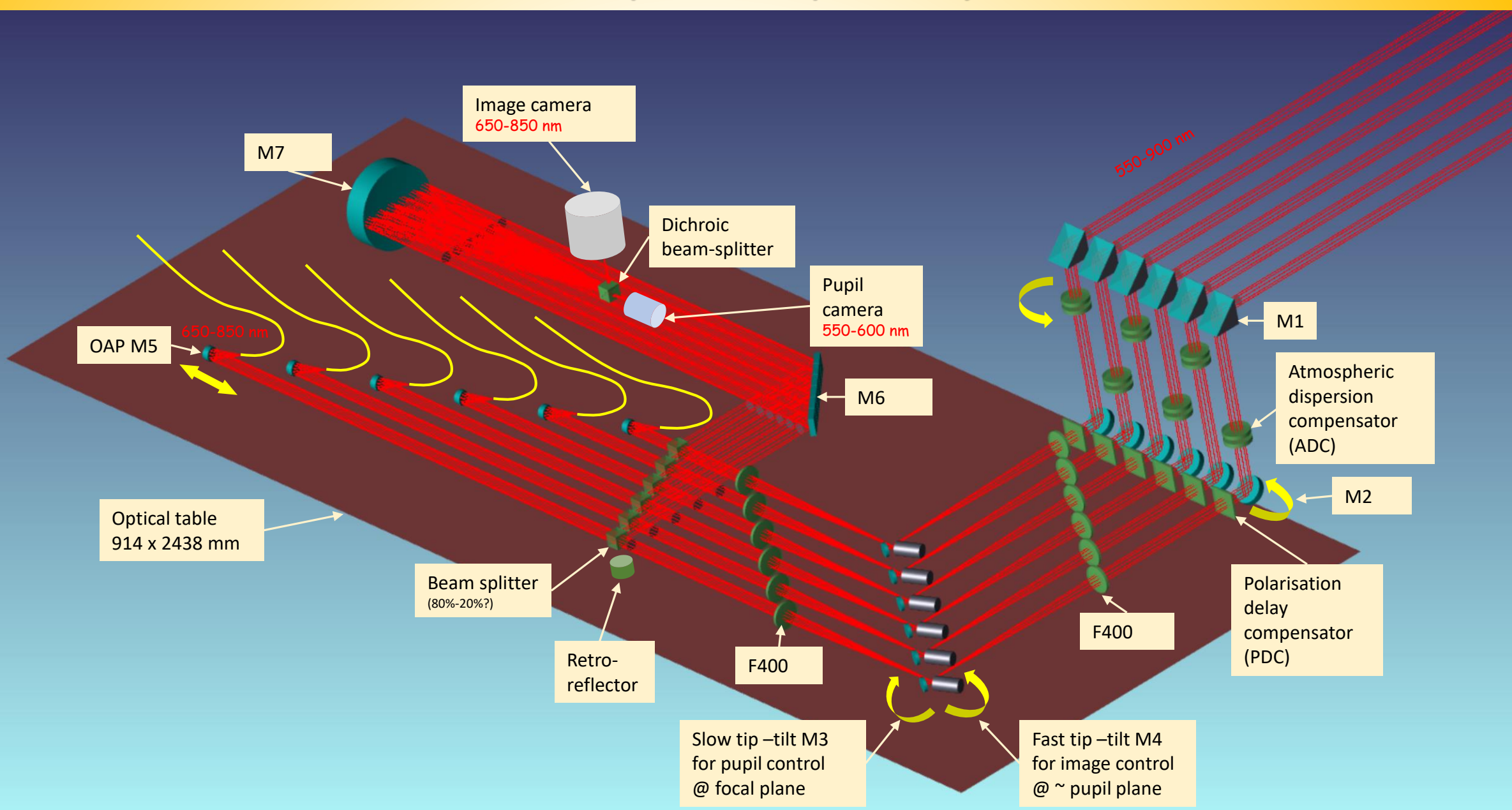
- 6 telescopes, 1016 mm diameter
- Baselines up to 330 m
- 6 beams separated by 3 inches (76,2 mm)
- Beam diameter: $\frac{3}{4}$ inches (19,05 mm)
- Magnification: 53,33
- Field of view: 0,3 to 0,6 arc-seconds
- Pupil max-min distance from North side of table: approx 18 m – 7m (to be precised)
- Pupil stabilization after LabAO: +/- 2% (TBC)
- Image stabilization after LabAO: +/- 0,3" (confirmed)

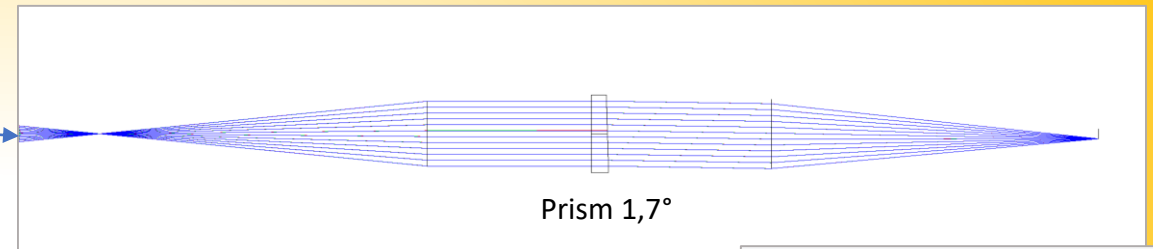
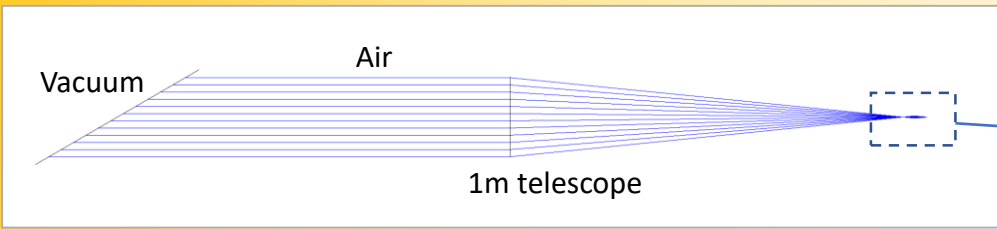


- Margin for the field: +/- 0,6" on sky (unvignetted), +/- 2,8 mm on the optics (min diameter 25 mm)
- Beam must remain centered on fast tip-tilt mirror (otherwise it generates fast piston): Fast tip-tilt placed at pupil plan
- All motorized tip-tilt mirrors must rotate around the center of the optical surface



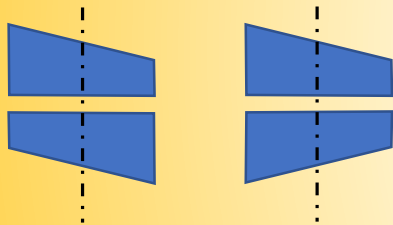
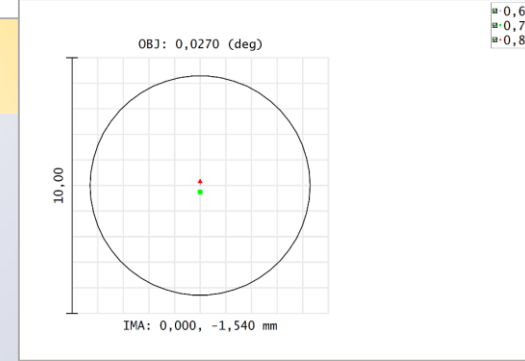
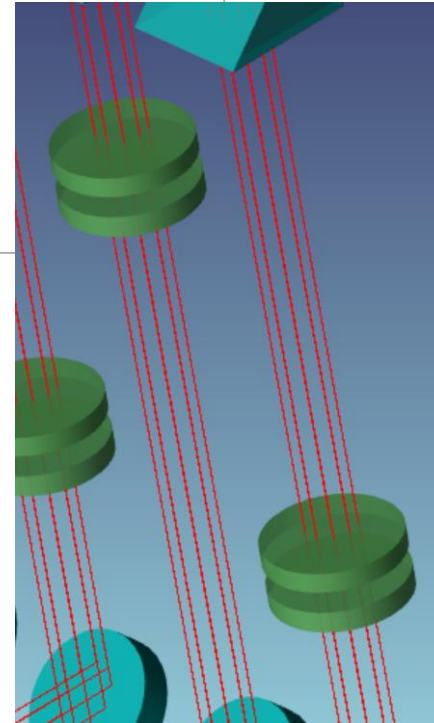
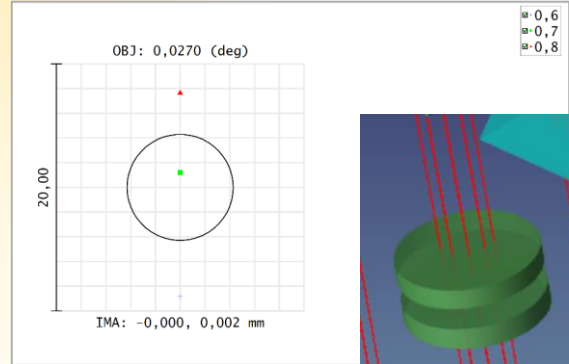
Zemax Optic Studio Optical Study





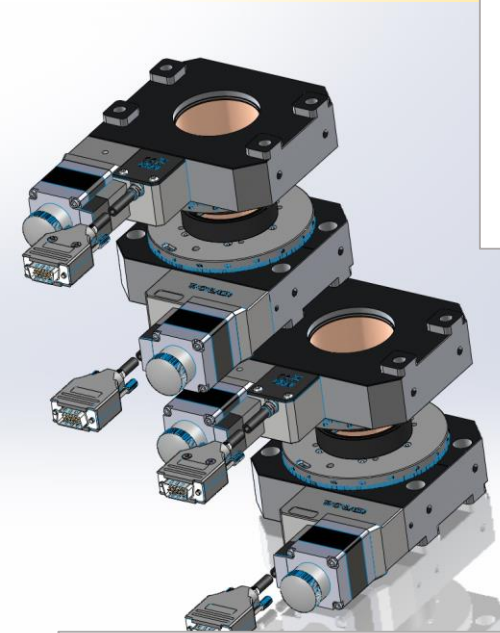
Simulation for 60° from zenith:
atmospheric dispersion

Global deviation: 53'
To be corrected with image
and pupil control...
Technical solution: 2 wedged
windows, with 2 motorized
orientations



No
correction

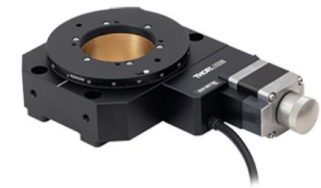
Max
correction



WEDGED SUBSTRATES
WSB - WSSQ - WSSQK

Wedge Substrate BK7 50mm Diameter 1 Degree Wedge Angle $\lambda/20$ WSB-50C08-20-1	$\phi 50\text{mm}$	BK7	3-6 WEEKS	€345.30
Wedge Substrate Synthetic Fused Silica 50mm Diameter 1 Degree Wedge $\lambda/20$ WSSQ-50C08-20-1	$\phi 50\text{mm}$	Synthetic fused silica	3-5 DAYS	€500.70

HDR50/M - Heavy-Duty Rotation Stage with SM2-Thread



Part Number: HDR50/M -Ask
[a technical question](#)
Package Weight: 2.50 kg / EACH
Available: Today
RoHS: RoHS
Price: € 2.585,03

Due to optical fibers, the vertical and horizontal polarisations have a different delay, and this delay may be different on the 6 beams.
 To correct this effect, a cristal material is inserted in each beam, and tilted to equalize the phase of V and H polarizations.
 Requires motorized or manual rotational stage?

On the right: extract from **A&A 543, A31 (2012)**, B. Lazareff, J.-B. Le Bouquin, and J.-P. Berger, *A novel technique to control differential birefringence in optical Interferometers, Demonstration on the PIONIER-VLTI instrument*

Compensation plate on Pionier instrument:

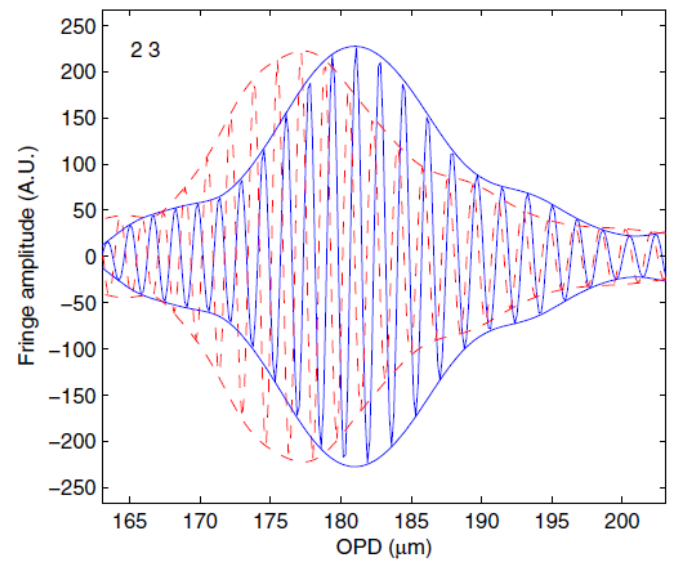
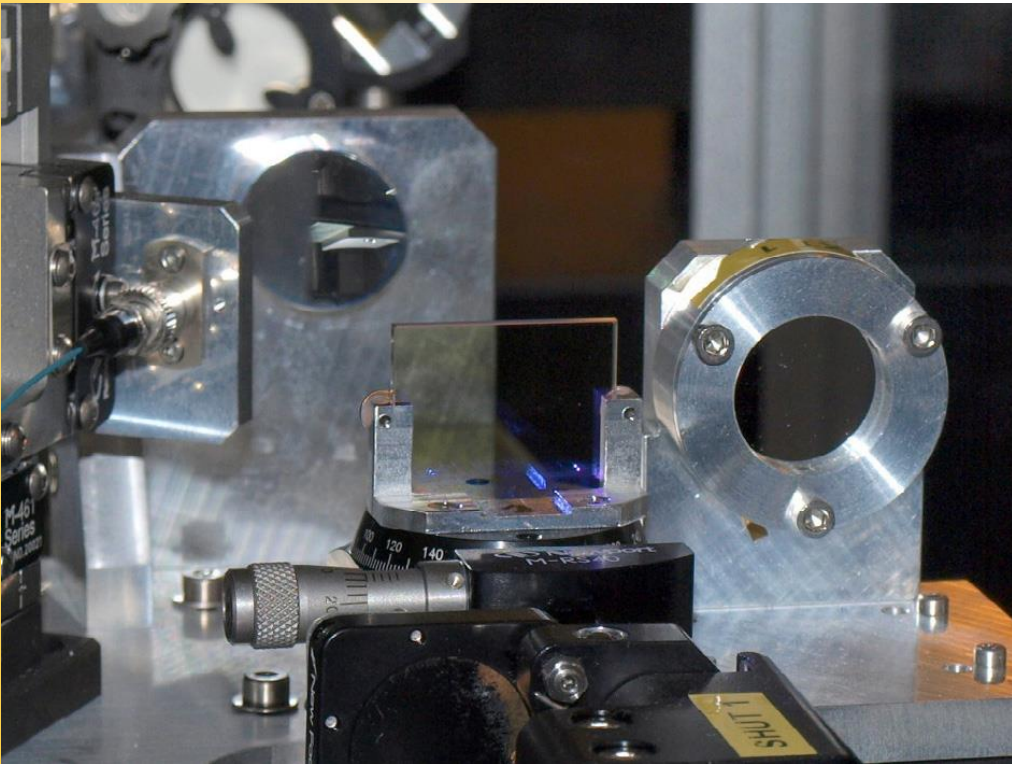


Fig. 1. Measured fringe packets in the Pionier instrument, between inputs 2 and 3, for the two linear polarizations, and with birefringence uncorrected.

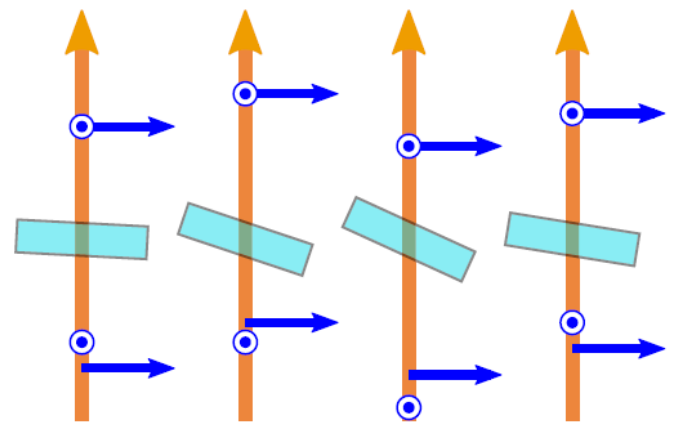
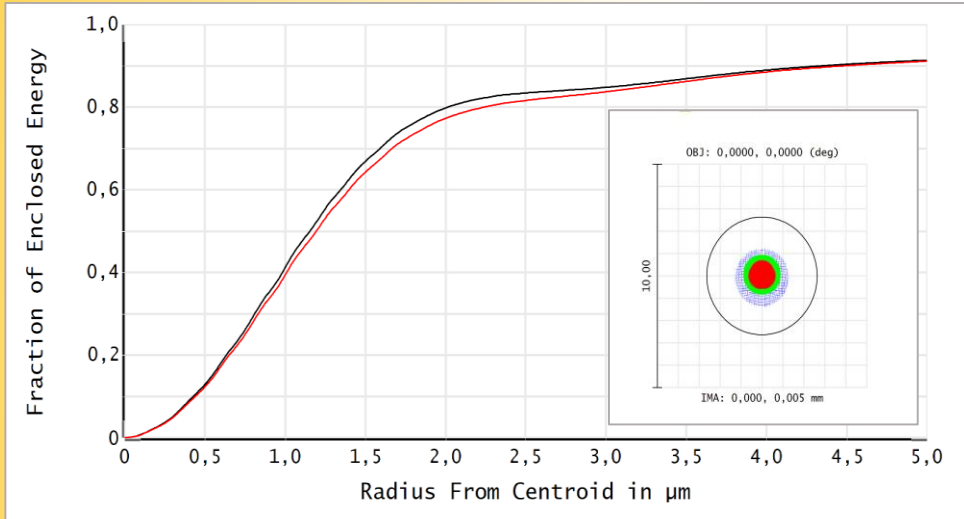
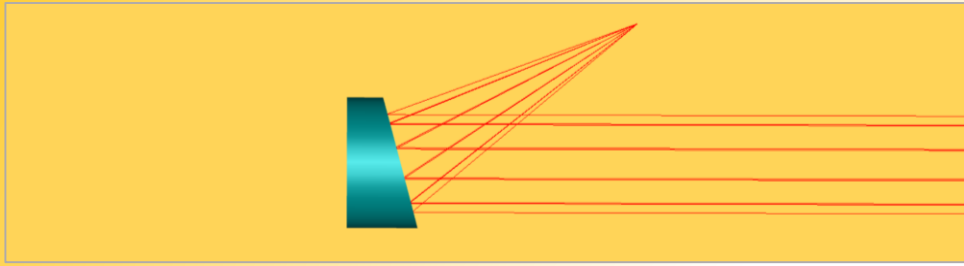
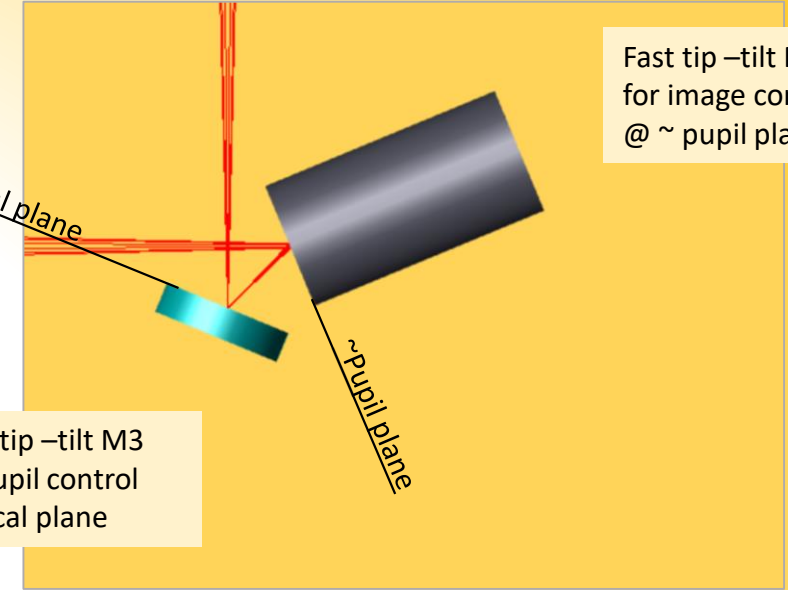


Fig. 2. Principle of the correction. Before traversing the birefringent plates, each beam is plagued by a differential delay between the horizontal and vertical polarizations. This differential delay can be canceled by suitably adjusting the inclination of each birefringent plate. The beam-to-beam delay is generally affected, but is easy to equalize once birefringence is taken care of. This figure is drawn as if the correction is performed after the unwanted birefringence has occurred; in the case of Pionier, the correction is in fact made upstream of the point where birefringence occurs.



- Airy radius: 2,6 microns
- Stroke: 109 microns
- Resolution: 2,7 nm = 1/1000^e airy radius



TECHSPEC Miroir Parabolique Hors Axe, Or Protégé, 100 Å, 25,4 x 54,4 mm
 EFL, 30°

Stock #35-491
€305,00

Qté 1-10 €305,00 Qté 11 €275,00 Prix sur Quantité Demande de Devis

EN STOCK 1

AU PANIER

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Leukos: Fibre monomode à maintien de polarisation de type Panda: PM630HP, 4/125/245um, 620-850nm, 200kpsi, Nufern® (VLK 016328).
 -> **Cœur 4 microns: 75% enclosed energy**

	S-330 2SH / S-330 2CL	Unit
Active axes	θ_x, θ_y	
Motion and positioning		
Integrated sensor *	SGS	
Tip / tilt angle in θ_x, θ_y at -20 to 120 V, open loop	3.5	mrad
Tip / tilt angle in θ_x, θ_y , closed loop	2	mrad
Resolution in θ_x, θ_y , open loop	0.02	μ rad
Resolution in θ_x, θ_y , closed loop	0.05	μ rad

Image Camera

Fast camera with windowing to stabilize injection into fibers.
 2,44 L/D on 3 pixels
 → F = 535 mm?

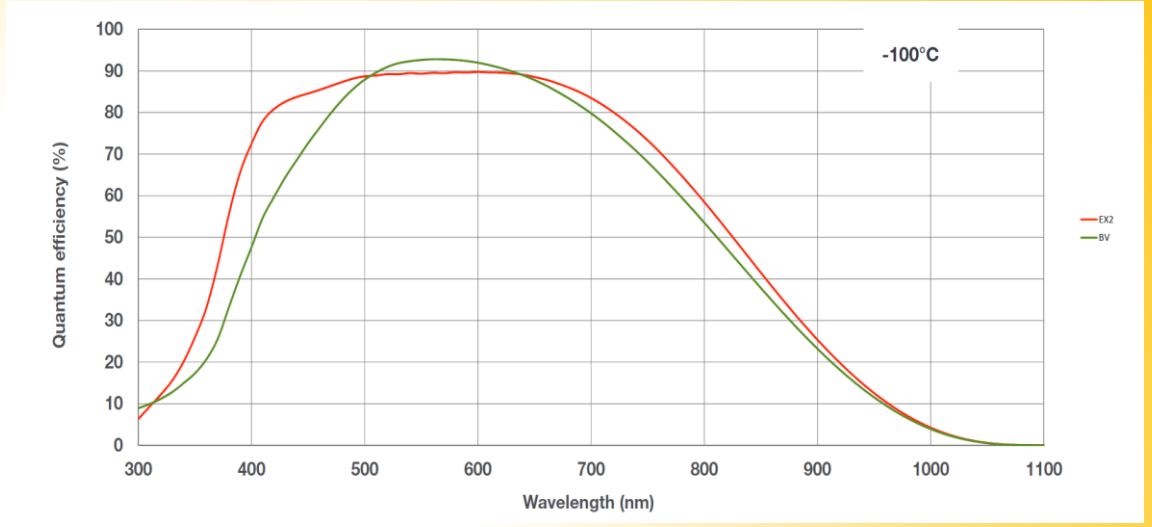
 → Parabole Edmund diam. 152,4 – F909,6
 → 3,4 pixels

iXon Ultra 897



Key Specifications

Active pixels (H x V)	512 x 512
Pixel size (W x H; μm)	16 x 16
Image area (mm)	8.2 x 8.2
Active Area Pixel Well Depth (e ⁻)	180,000
Max Readout Rate (MHz)	17
Frame rates (fps)	56 (full frame) - 11,074
Read noise (e ⁻)	<1 with EM gain
QE Max	>95%

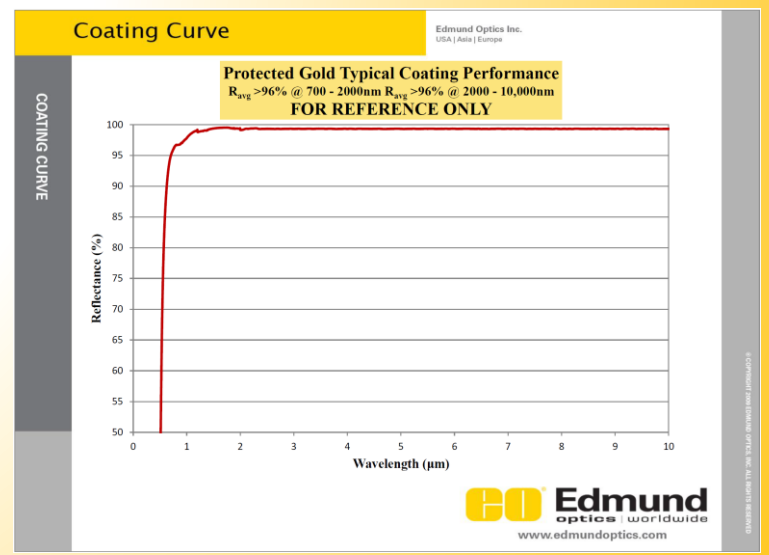


TECHSPEC[®] 6" de Dia. x 24" FL Or Protégé, Miroir Parabolique

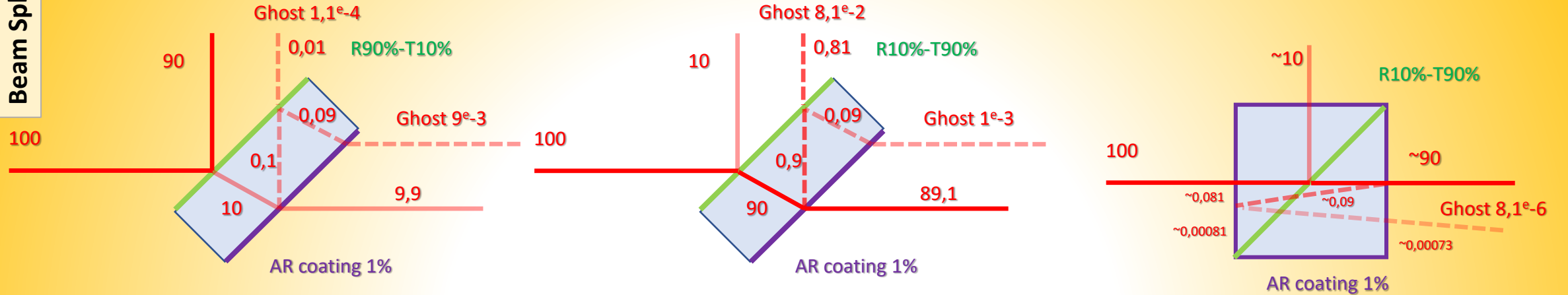


Stock #32-069-566
€790,00

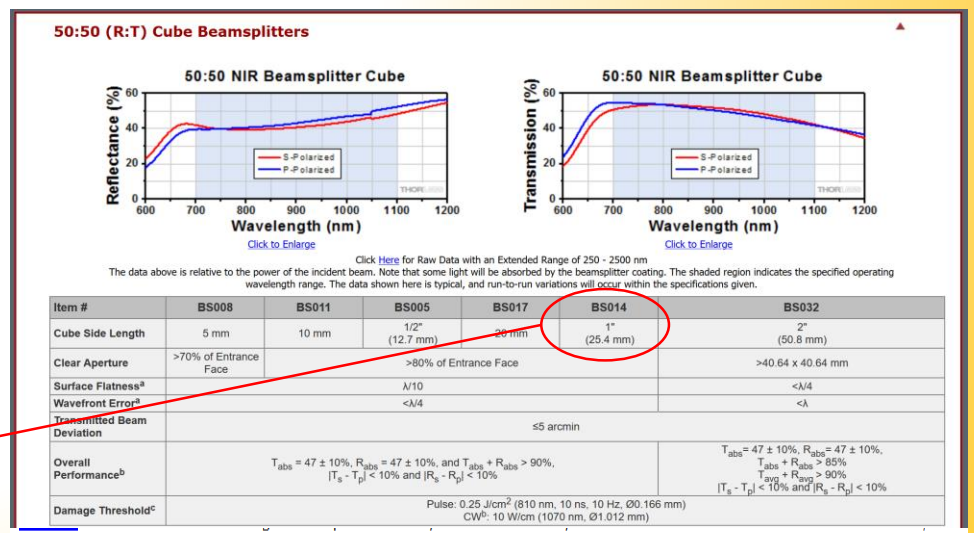
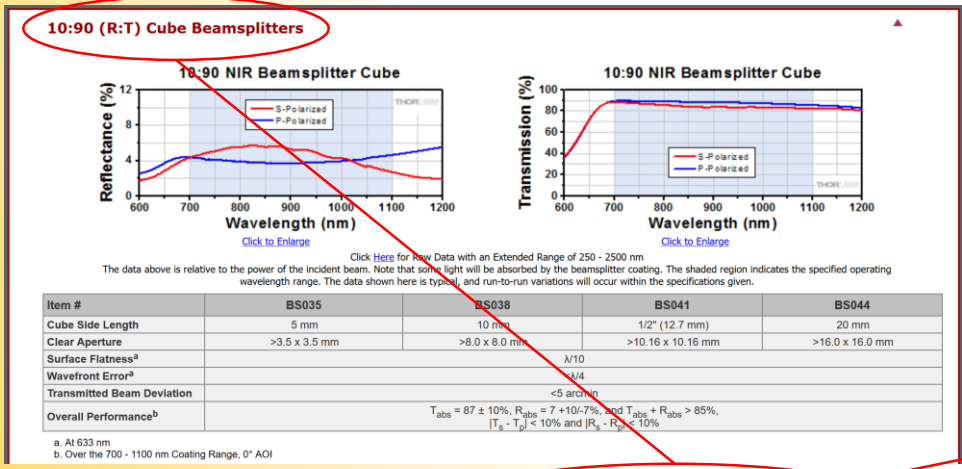
- Qté 1-4
€790,00
- Qté 5
€719,00
- Prix sur Quantité
Demande de Devis



Ratio: 90/10? To be determined...
 The design presented in this document implies that science beam (high percentage) is in transmission.

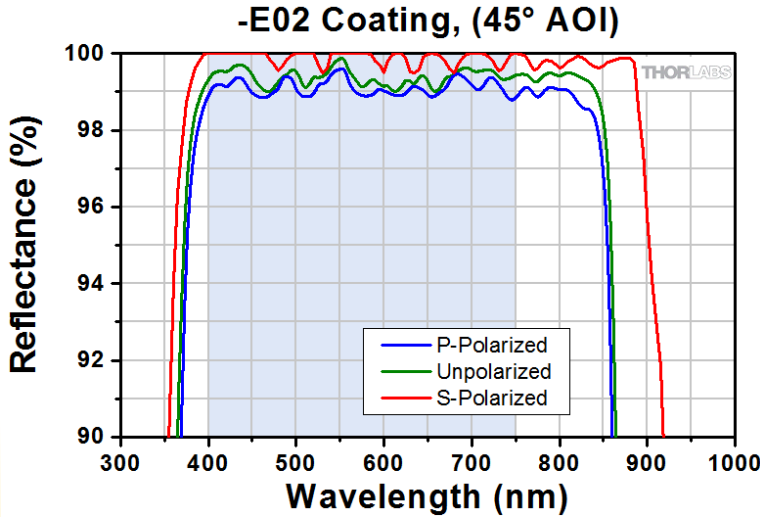
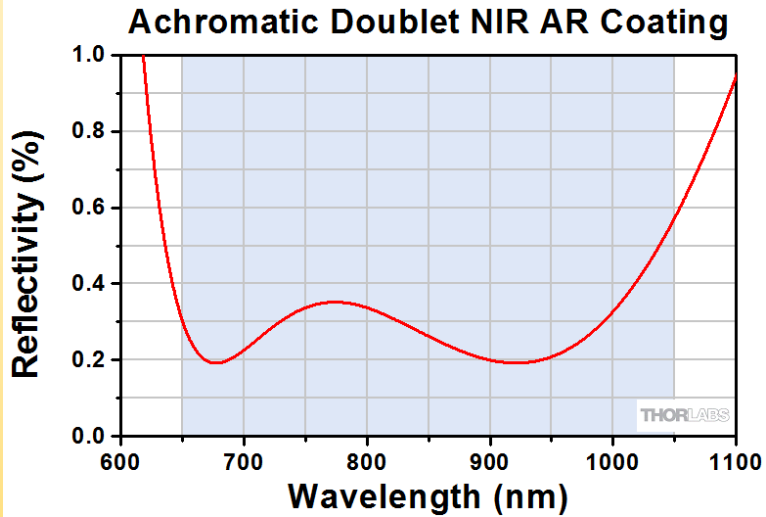
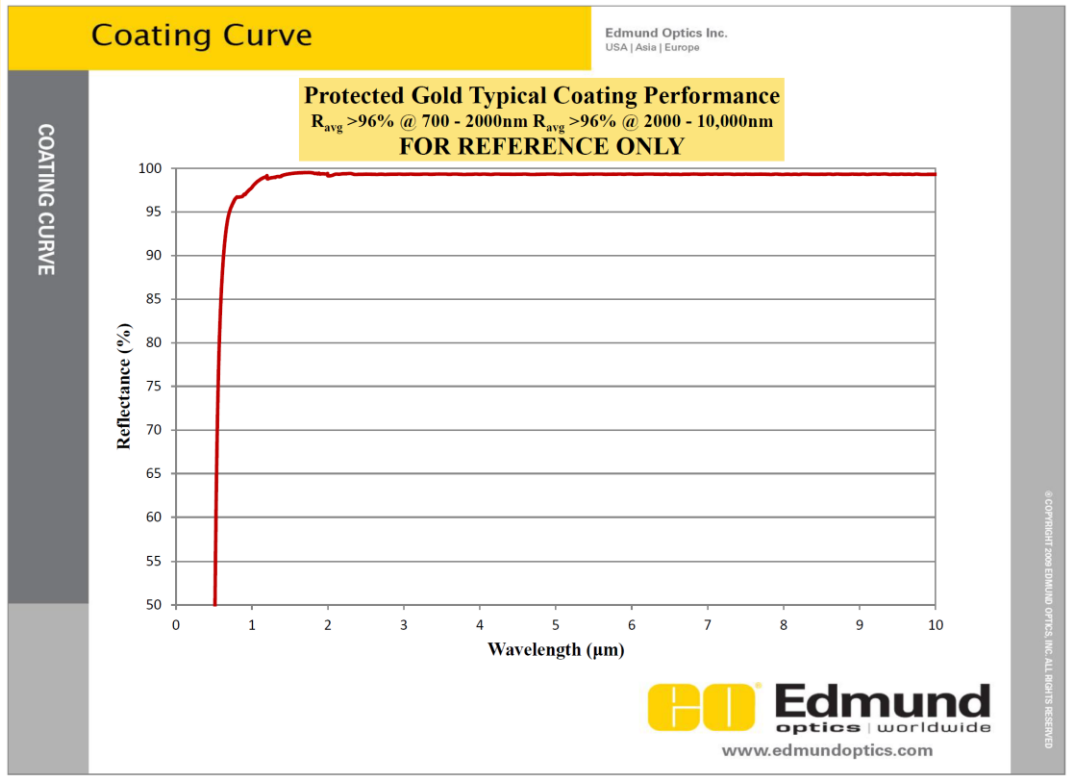
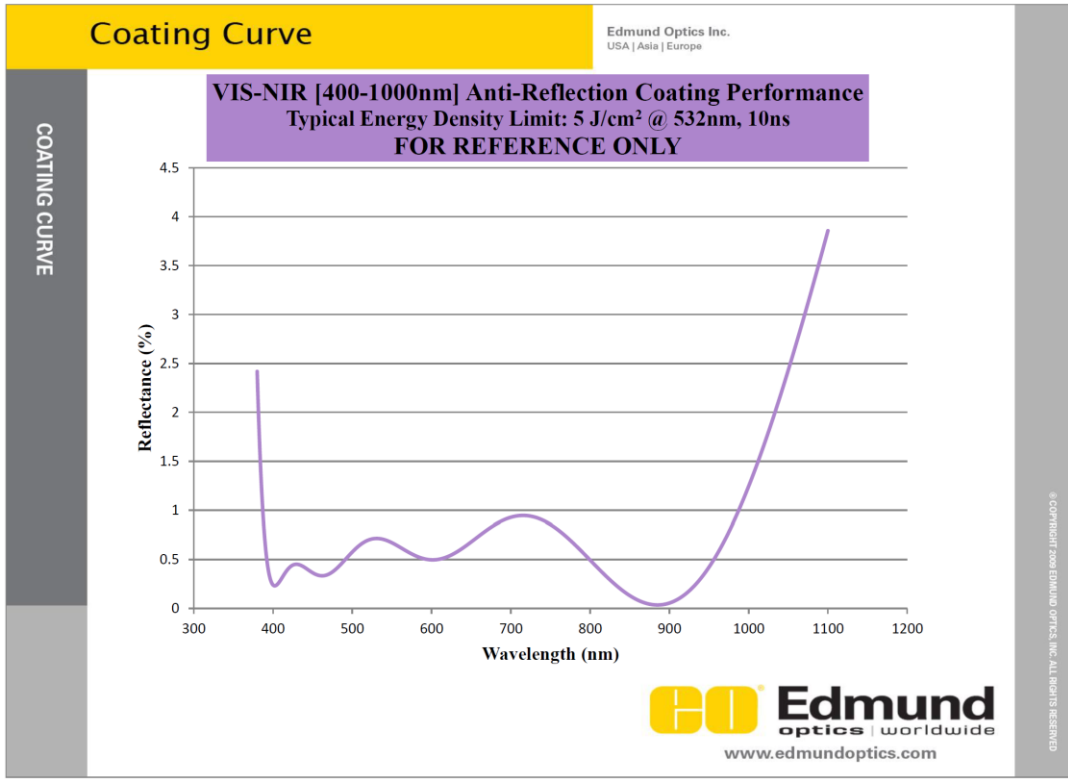


→ Use a cube beam splitter!



Ask for custom manufacturing?

BS014 50:50 Non-Polarizing Beamsplitter Cube, 700 - 1100 nm, 1" € 207,55



MY CART - 1 product [EXPORT YOUR CART](#) [IMPORT YOUR CART](#) [REQUEST A QUOTE](#)

ADD A REFERENCE x 1 [ADD IT](#)

Stock	UP	Qty	Total
WEDGE SUBSTRATE BK7 50MM DIAMETER 1 DEGREE WEDGE ANGLE A/20 REF: WSB-50C08-20-1	DELIVERY IN 3-6 WEEKS €345.30	12	€4,143.60

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COUPON CODE ? [APPLY](#)

SUBTOTAL €4,143.60
VAT €828.72
TOTAL €4,972.32

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RÉSUMÉ DE LA COMMANDE [PASSER COMMANDE](#)

Composants (13): €3.976,00
Remise sur quantité: -€270,00
Total Estimé de la Livraison: A Déterminer
Sous-total HT: €3.706,00

[APPLIQUER CODE](#) [AJOUTER PRODUIT](#)

6" de Dia. x 24" FL Or Protégé, Miroir Parabolique **2-3 JOURS No. de Stock #32-069-566 €790,00** 1 [PRIX SUR QUANTITÉ](#) Total: €790,00
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Numéro de pièce client:

Miroir Parabolique Hors Axe, Or Protégé, 100 Å, 25,4 x 54,4 mm EFL, 30" **EN STOCK No. de Stock #35-491 €305,00** 6 [PRIX SUR QUANTITÉ](#) Total: €1.830,00
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Numéro de pièce client:

50mm, Traité BBAR, traité VIS-NIR, Prisme à Angle Droit **2-3 JOURS No. de Stock #84-520 €226,00 €181,00** 6 [PRIX SUR QUANTITÉ](#) Total: €1.356,00
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Numéro de pièce client:

My Shopping Cart [Forward Your Shopping Cart](#)

Please note: There is a mixture of Imperial and Metric items in your shopping cart.

Item	Image	Part Number	Ship Date	Qty	Price	Subtotal	Remove
1		BB2-E02- (WEIGHT (Total)):0.50 Kgs Ø2" Broadband Dielectric Mirror, 400 - 750 nm	Today	6	€-142,29* € 136,60	€ 819,60	<input type="checkbox"/>
2		BB1-E02- (WEIGHT (Total)):0.05 Kgs Ø1" Broadband Dielectric Mirror, 400 - 750 nm	Today	2	€-70,31* € 67,50	€ 135,00	<input type="checkbox"/>
3		BB1-E02-10- (WEIGHT (Total)):0.15 Kgs Ø1" Broadband Dielectric Mirror, 400 - 750 nm, 10 Pack	Today	1	€-632,83* € 607,52	€ 607,52	<input type="checkbox"/>
4		MRA25-E02- (WEIGHT (Total)):0.23 Kgs Right-Angle Prism Dielectric Mirror, 400 - 750 nm, L = 25.0 mm	3-5 Days	6	€-145,16* € 139,35	€ 836,10	<input type="checkbox"/>
5		AC508-400-B- (WEIGHT (Total)):0.74 Kgs f = 400.0 mm, Ø2" Achromatic Doublet, ARC: 650 - 1050 nm	3-5 Days	12	€-129,84* € 124,65	€ 1.495,80	<input type="checkbox"/>
6		PS976M-B- (WEIGHT (Total)):1.40 Kgs Retroreflector, SM2-Threaded Mount, AR Coating: 650 - 1050 nm	3-5 Days	6	€-248,86* € 238,91	€ 1.433,46	<input type="checkbox"/>
7		BS014- (WEIGHT (Total)):0.44 Kgs 50:50 Non-Polarizing Beamsplitter Cube, 700 - 1100 nm, 1"	Today	6	€-207,55* € 199,25	€ 1.195,50	<input type="checkbox"/>
8		BSC203- (WEIGHT (Total)):15.97 Kgs Three-Channel APT™ Benchtop Stepper Motor Controller	Today	2	€-2.776,83* € 2.665,76	€ 5.331,52	<input type="checkbox"/>
9		HDR50/M- (WEIGHT (Total)):15.00 Kgs Heavy-Duty Rotation Stage with SM2-Threaded Center Hole, Metric	Today	6	€-2.585,03* € 2.481,63	€ 14.889,78	<input type="checkbox"/>
10		T38V- (WEIGHT (Total)):430.20 Kgs Nexus Optical Table, 3' x 8' x 8.3", Sealed 1/4"-20 Mounting Holes	* See Note	1	€ 4.564,11	€ 4.564,11	<input type="checkbox"/>

*** NOTE: ***
The quantity you have requested for part number T38V exceeds available stock.
After you have finalized your order, a customer representative will contact you with an exact delivery date, or you are welcome to contact us by phone at +33 (0) 970 444 844 or by email at sales.fr@thorlabs.com.

*** All tables require modification to accept earthquake restraints. Please contact tech support to order an optical table equipped with the necessary alterations.**

* For Thorlabs Price and Discount Policy please see [Thorlabs Price Policy](#).
WEIGHT (Total): 464.68 Kgs

TOTAL: € 31.308,39