## 45° RGB SBR HOE for the evaluation of the performance of holographic recording materials

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Conceptual drawing of set up



Implementation of sketch





Photo-cell in plateholder to measure flux on both sides of plate



Weak negative lens pre-spreads beam before entering spatial filter, and is translated to shift beam profile to achieve 1:1 ratio on both sides of plate



Irises placed in spread beam under fill photo-detector for measurement of fluxes.

Positioning irises to be incident at exactly the same spot on the plate.









The 2 photo-detector positions





#### Measuring the 1<sup>st</sup> order at 0 degrees incidence







#### 6 measurements taken at 2 detector positions

SAMPLE #	EXPOSURE	0 ORDER @ 0	1 <sup>st</sup> ORDER @ 0	0 ORDER @ 45	1 <sup>st</sup> ORDER @ 45
97	150	75	12	80	10
98	300	36	44	40	46
99	600	20	60	24	60
100	1200	25	56	25	60
101	2400	26	40	40	36

Typical measurements. 1<sup>st</sup> order readings can be directly translated into diffraction efficiency. (Ultimate U04 @ 633nm. Exposure readings in microJoules per square centimeter.)

SAMPLE #	0 ORDER @ 0	1st ORDER @ 0	0 ORDER @45	1st ORDER @ 45	EXPOSURE
64	6	34	3	40	1600
65	10	62	5	60	2200
66	10	58	8	56	3200
67	12	44	10	38	4500

Typical measurements. 1<sup>st</sup> order readings can be directly translated into diffraction efficiency. (Sphere-S GEO-3 @ 458nm. Exposure readings in microJoules per square centimeter.)

#### Secondary Reflected 1st Orders

#### **Transmitted Order**

#### **Incident Beam**

#### Zero Order

Reflected 1st Order

**Transmitted Order** 

Where does all the unaccounted energy go?



#### Implementing Ocean Optics Jaz Spectrometer

### Reflection of Light Source from HOE's glass surface

Input to Fiber Optic Cable



Caution: Light sensitive contents MADE FOR GEOLA BY SPHERE-S GEOLA **GEO-03 Red Green Blue Sensitive** Qty Film roll: M cm x Cut Sheets: cm x cm Holoplates: SO cm x40/cm Parameters: Max of spectral Sensitization: 457/514/633nm Resolving Power: >5000 lines/mm Sensitivity at 457 nm: 2000 microJoules/cm<sup>2</sup> Diffraction Efficiency at 457 nm: >25% Sensitivity at 514 nm: 3000 microJoules/cm? Diffraction Efficiency at 514 nm: >45% Sensitivity at 633 nm: 3000 microJoules/cm<sup>2</sup> Diffraction Efficiency at 633 nm: >45% Starage conditions: Temperature: 4 Degrees Celsius HumidKy: 30% Batch number **Best Before** UAB 'Geola Digital" Naugarduko 41, Vilnius 03227, Lithuania E-mail: info@geola.com

Fax: +37052132838 URL: www.geola.com



Zero order extinction as seen by Jaz Spectrometer

















When the HOE strongly diffracts green, its shadow is magenta. For more comparisons of holographic recording materials, click on http://edweslystudio.com/Research/AllHolos/AllHoloPreamble.html http://edweslystudio.com/Formulae/HoloConsRepG/HoloConsRepG.htm http://edweslystudio.com/Research/DE615/DE.html