



Beam dump materials evaluation - scatter, reflectivity and laser damage threshold (CW 1064nm)

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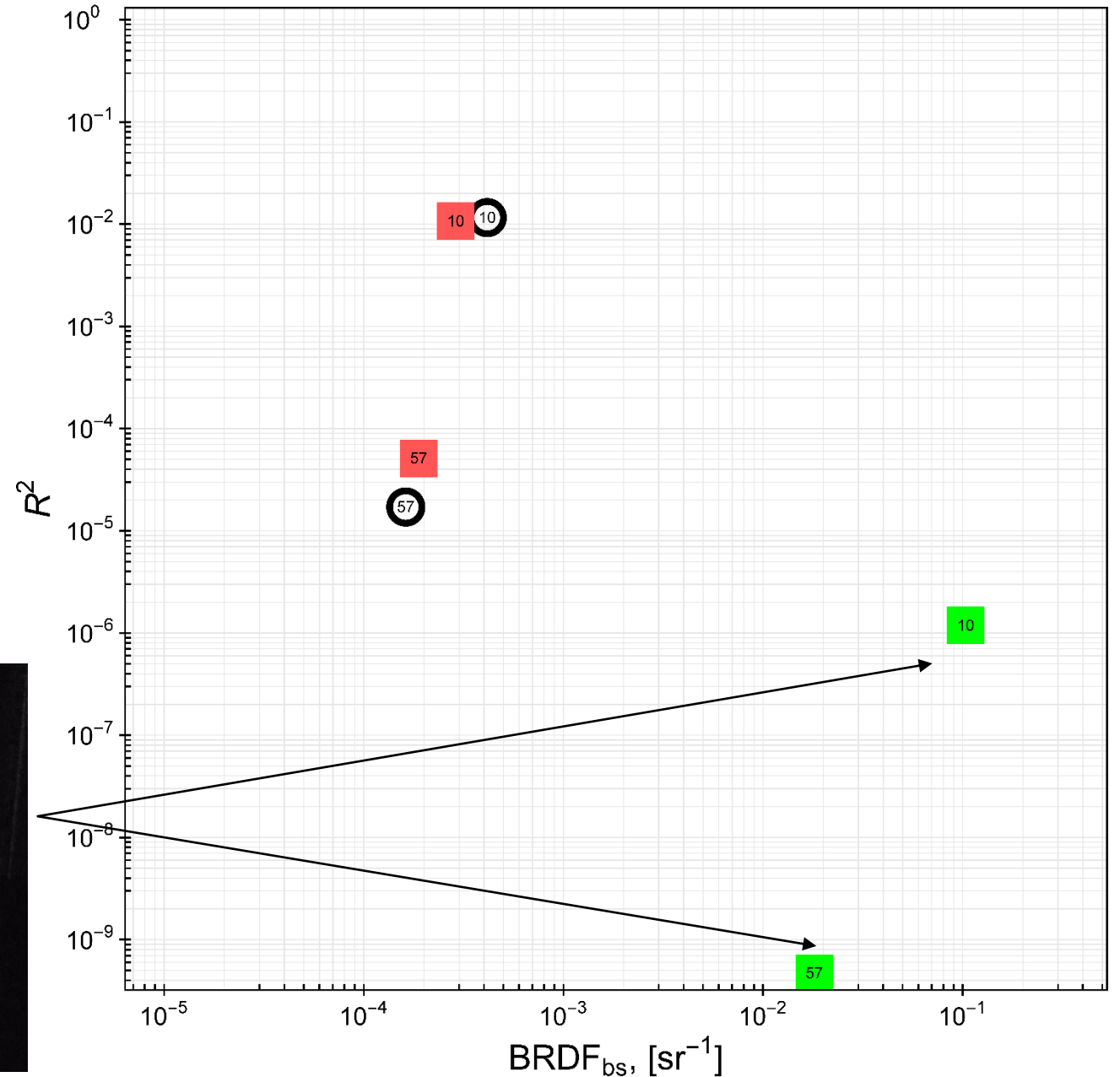
Optical properties

 DLC coated super #8 non-directionalSSTL sample <https://dcc.ligo.org/LIGO-S1700276-v2>

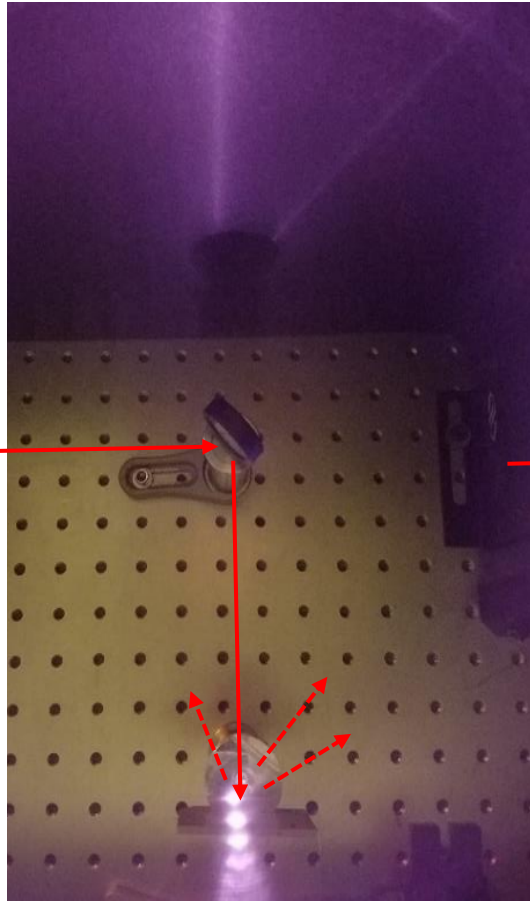
 Sintered SiC sample <https://dcc.ligo.org/S1700637>

 Uncoated black glass <https://dcc.ligo.org/LIGO-T1700128>

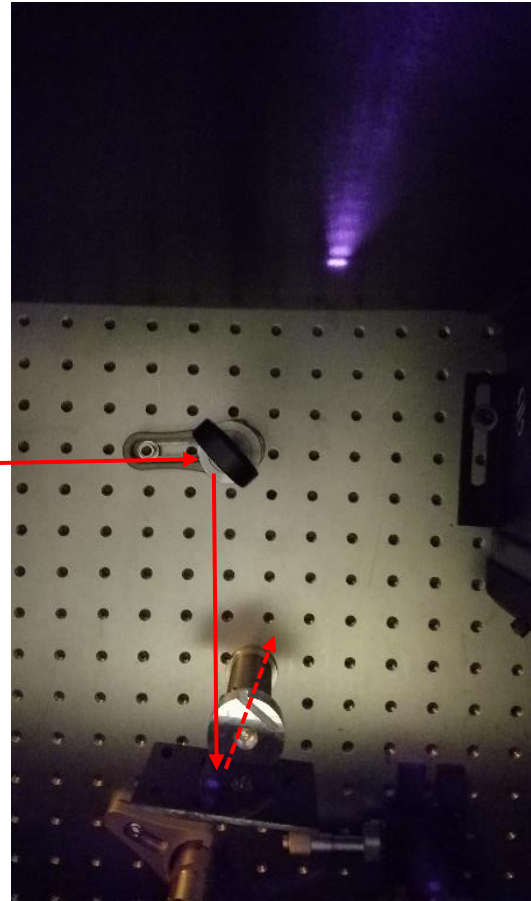
Reflectivity measurement of sintered SiC is compromised (size of the reflection > size detector's largest aperture)



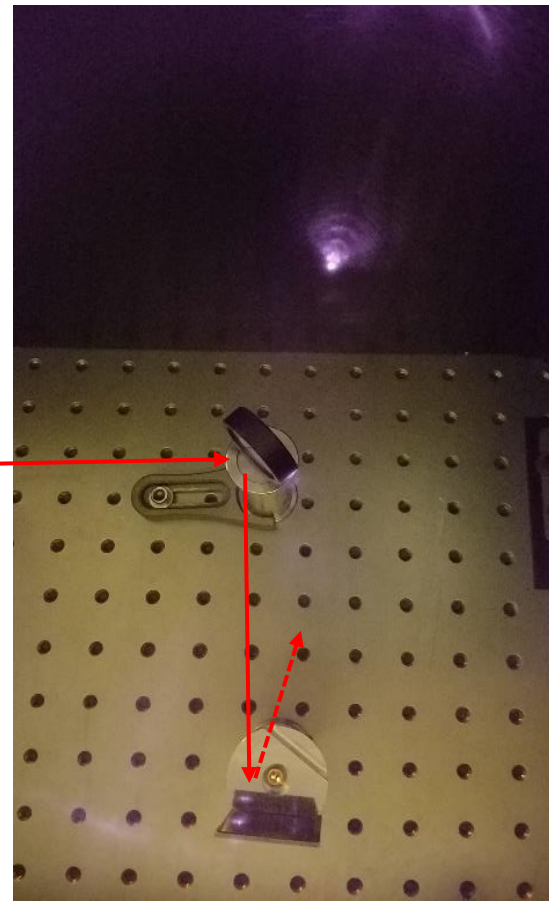
Some visualization – no numerical evaluation



SiC



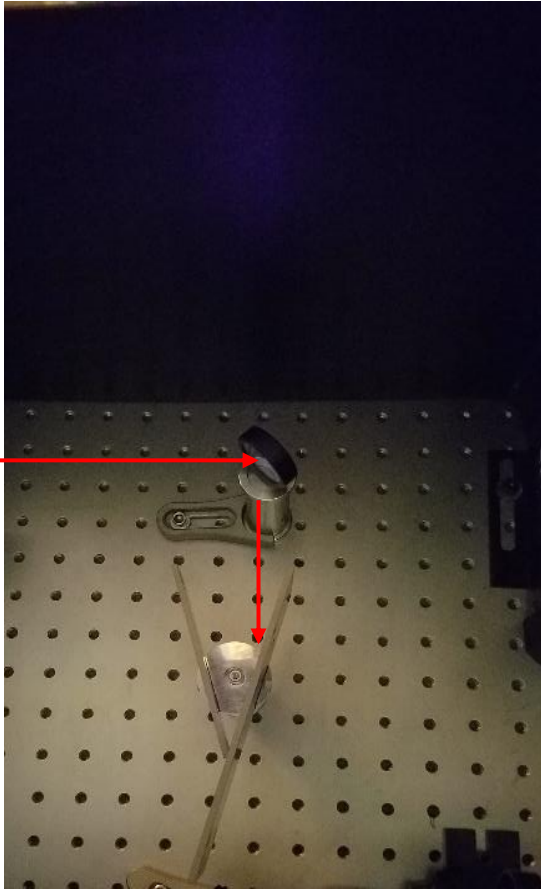
Black glass



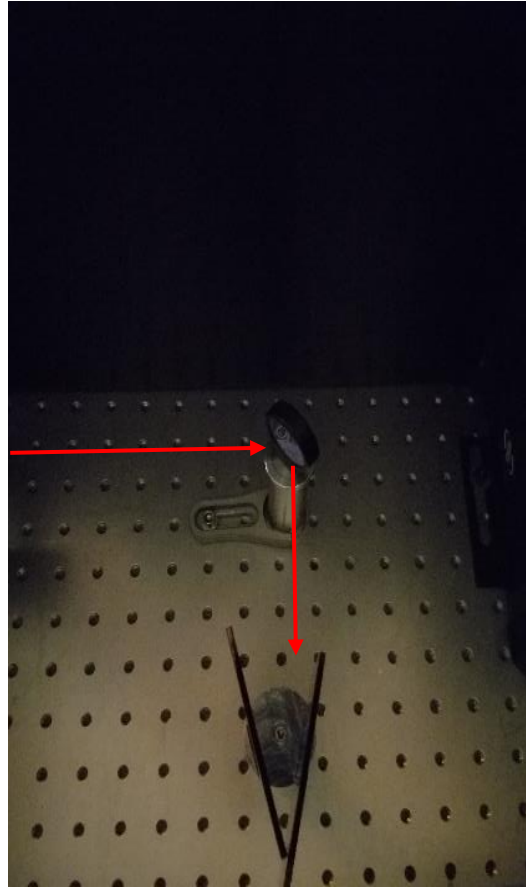
DLC

For details see
<https://dcc.ligo.org/LIGO-T1800001>

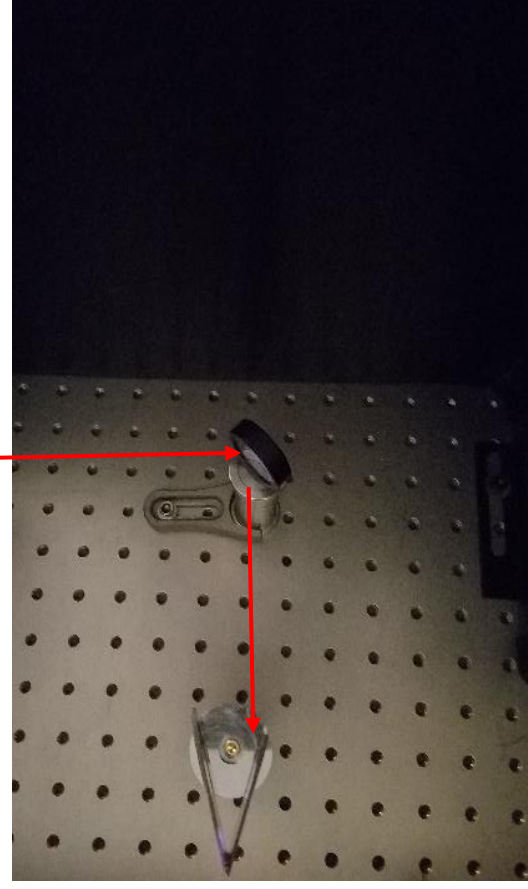
Some visualization – no numerical evaluation



SiC



Black glass



DLC

For details see
<https://dcc.ligo.org/LIGO-T1800001>

Laser damage – CW 1064nm 3.2×3.7 mm ellipse 5 min per point irradiation

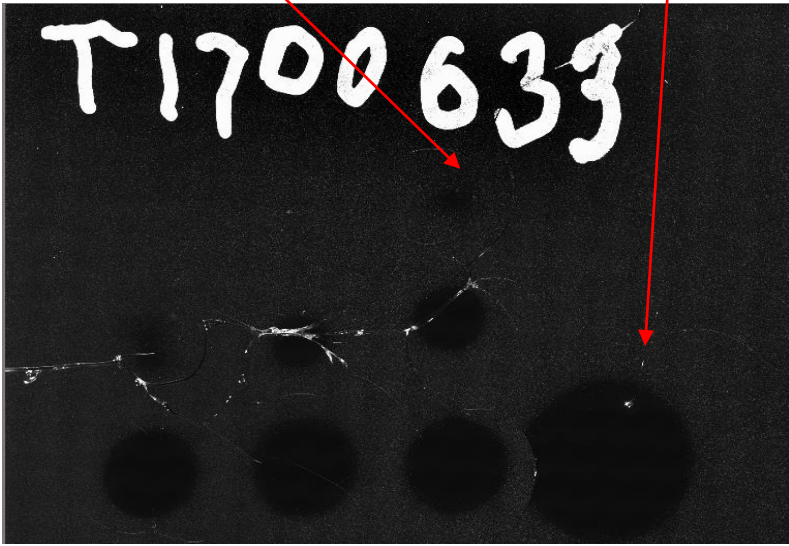
0.3 W/mm²
(2.86 W total)

1.14 W/mm²
(10.74 W total)

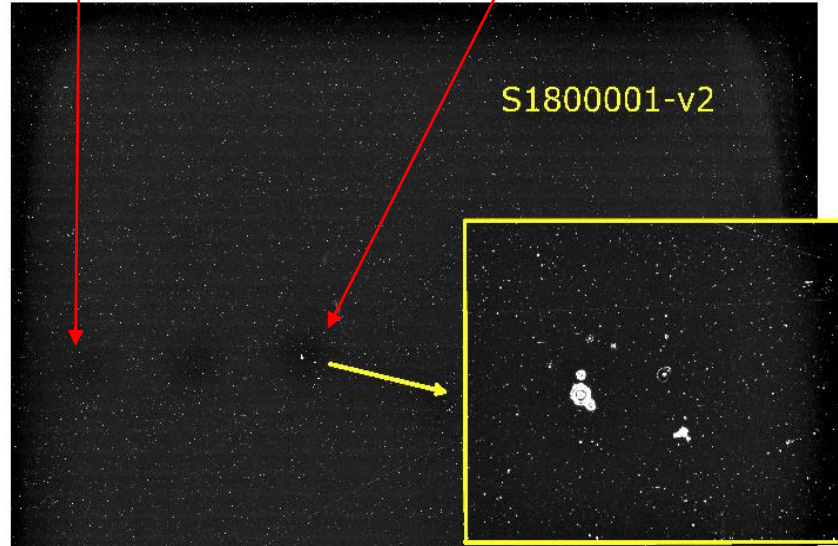
3.92 W/mm²
(31.8W total)

5.03 W/mm²
(47.6 W total)

Up to 5.03W/mm² (47.6 W total)
– no damage



Black glass



DLC



SiC

For details, before and after pics and iv-air vs in-vacuum comparison see <https://dcc.ligo.org/E1700388-v3>