Experimental Analysis of Multiple Scattering BRDF Models Supplemental Material

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ACM Reference Format:
Feng Xie*, James Bieron*, Pat Hanrahan, and Pieter Peers. 2021. Experimental Analysis of Multiple Scattering BRDF Models Supplemental Material. In *Proceedings of ACM Siggraph Asia conference (Siggraph Asia).* ACM, New York, NY, USA, 1 page. https://doi.org/10.1145/nnnnnnn.nnnnnnn

1 CSSIM ERROR FOR COSINE WEIGHTED *L2* FITTED PARAMETERS

Figure 1: CSSIM errors for the renderings of a sphere under the Eucalyptus Grove light probe over all the MERL materials for the cosine weighted *L2* BRDF fits of the differenty BRDF models.

Figure 1 shows that for the fitted BRDF parameters obtained with the cosine weighted *L2* fitting metric, the *Heitz* model has almost identical visual fidelity as the standard *GGX* model for the smooth materials (right) and slightly better visual fidelity than the *GGX* model for the rough materials (left). Even though the *L2* error graph in Figure 3 in the main paper (right-top) shows the *Heitz* model to have worse data fidelity for some smooth materials. The *Heitz* BRDF model outperforms the *GGX* model in terms of visual fidelity in both cosine weighted *L2* and image based adaptive fitting.

2 *GGX* AND *HEITZ* FITTING PARAMETERS

While there is little visible visual difference between the *GGX* and *Heitz* fitting for most of the rough materials in the MERL dataset,

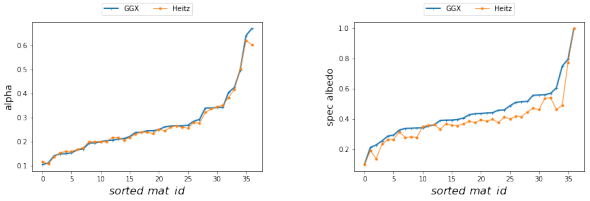

Figure 2: Comparing α and specular *albedo* parameters computed for the *GGX* and *Heitz* BRDF model parameters computed using image based adaptive fitting.

the fitted parameters for the two models differ most in their specular *albedo*. Figure 2 shows that the specular *albedo* for the *Heitz* model is lower than for the *GGX* model for most of the materials (right) and that α for the *Heitz* model is slightly lower for some materials (left).

For this comparison, we filtered out 15 rough material whose total *albedo* is greater than 1 because these BRDF fits are suboptimal for two reasons [1]:

(1) These BRDF fits have a high visual fitting error; and
(2) These BRDF fits are not physically plausible and can produce unexpected results in a physically based renderer that requires energy conservation.

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Siggraph Asia, Dec 2021, Tokyo , Japan

ACM ISBN 978-x-xxxx-xxxx-x/YY/MM…$15.00
https://doi.org/10.1145/nnnnnnn.nnnnnnn

[1] For the filtered out materials, the *Heitz* model's specular albedo is also lower than for the *GGX* model.