Practical Multiple-Scattering Sheen Using Linearly Transformed Cosines Supplemental Material

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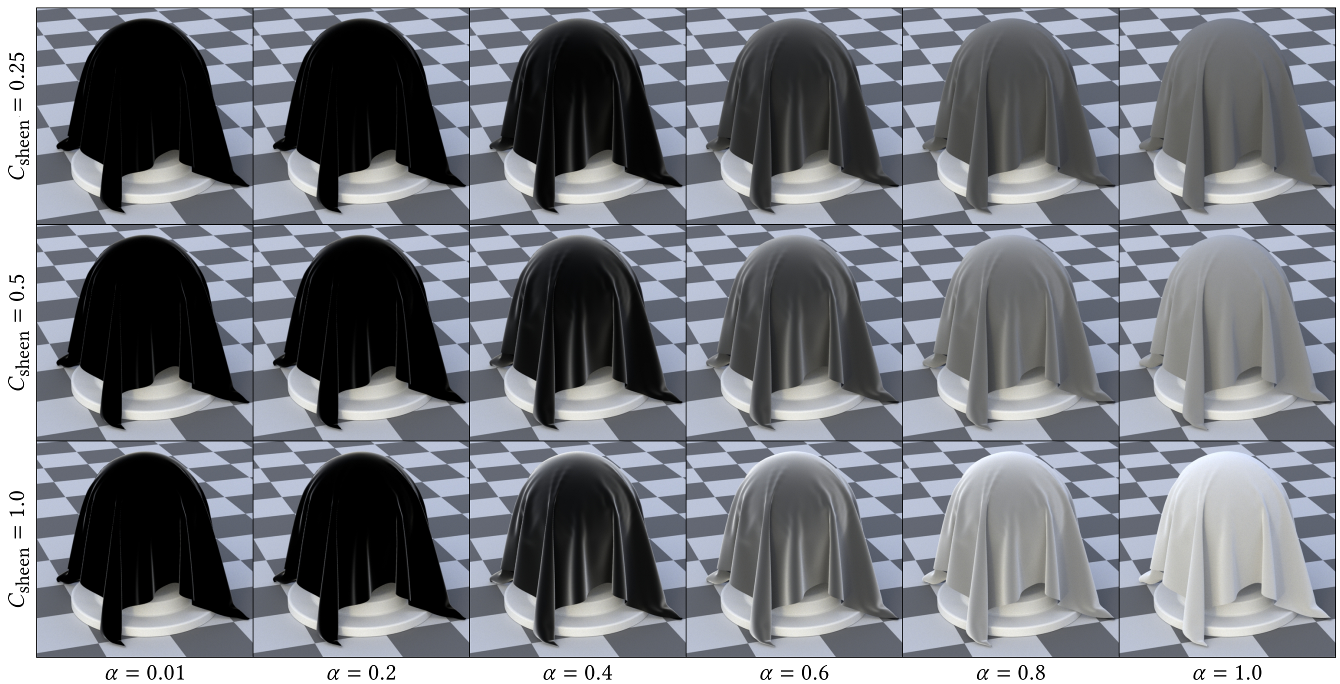

Figure 1: Parameter space of our proposed sheen model applied to a draped cloth example. The columns show varying roughness values α whereas the rows show varying sheen scales C_{sheen}.

1 OVERVIEW

This document contains additional comparison figures of our sheen BRDF against prior work.

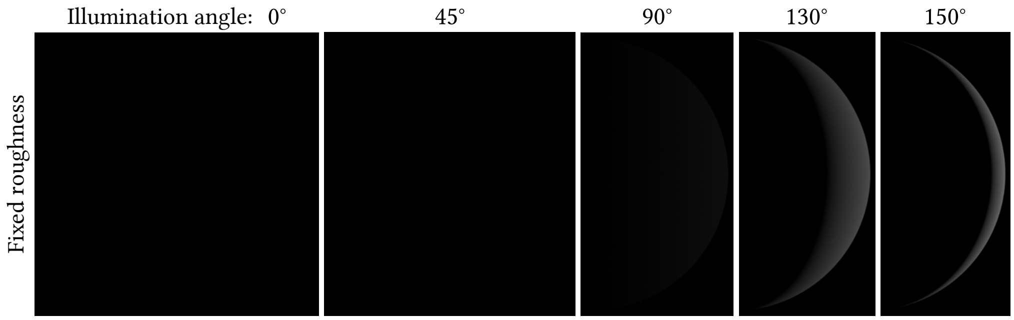

Figure 2: Sheen model from the *Principled BRDF* by Burley [2012] at varying illumination angles. Note that there is only forward scattering and a lack of backward scattering. There also is no roughness or shape control.

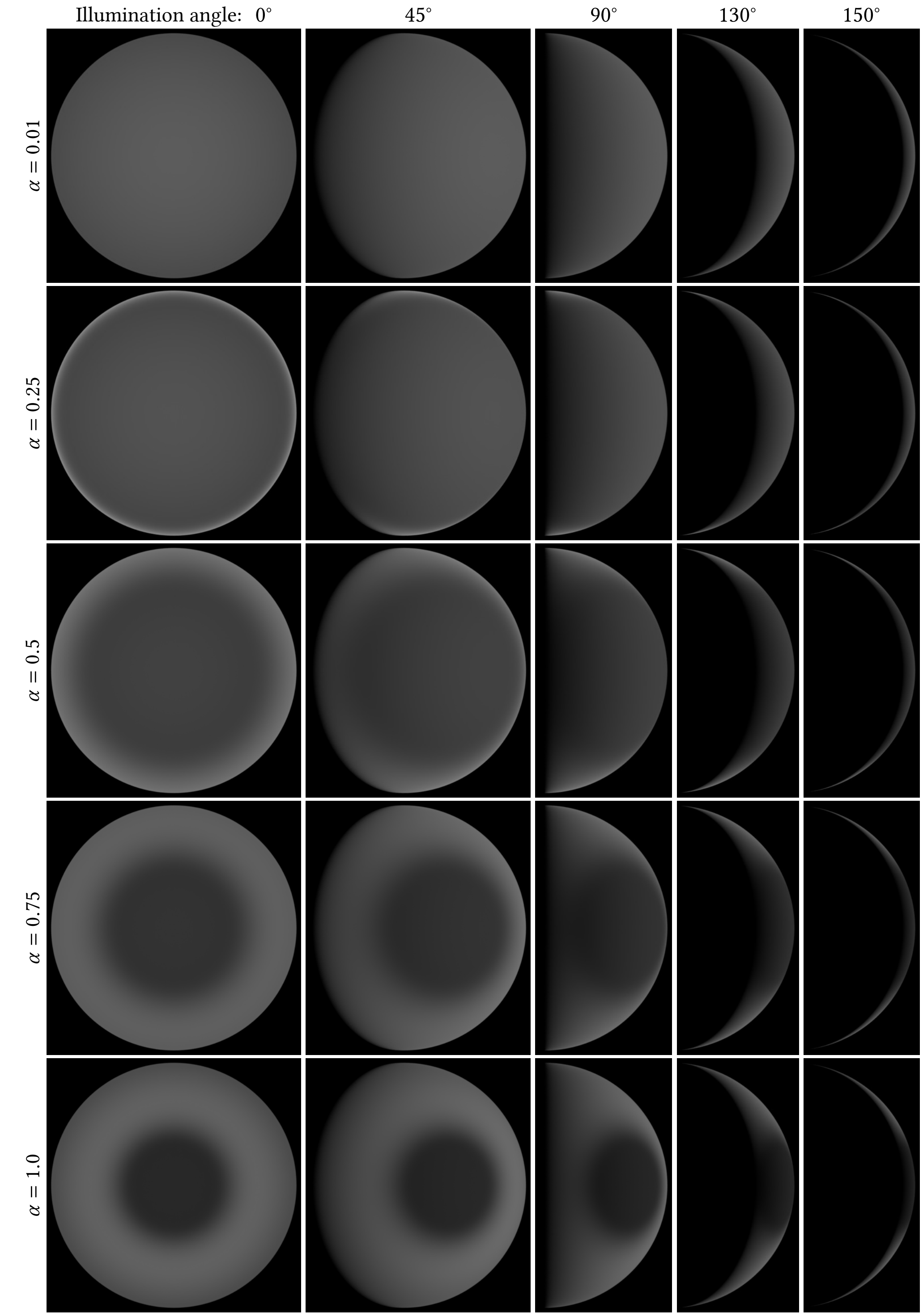

Figure 3: Production sheen model by Neubelt and Pettineo [2013] for varying roughness values α at different illumination angles. This model is based on the earlier model by Ashikmin et al. [2000] and uses an inverted Gaussian microfacet distribution as a base.

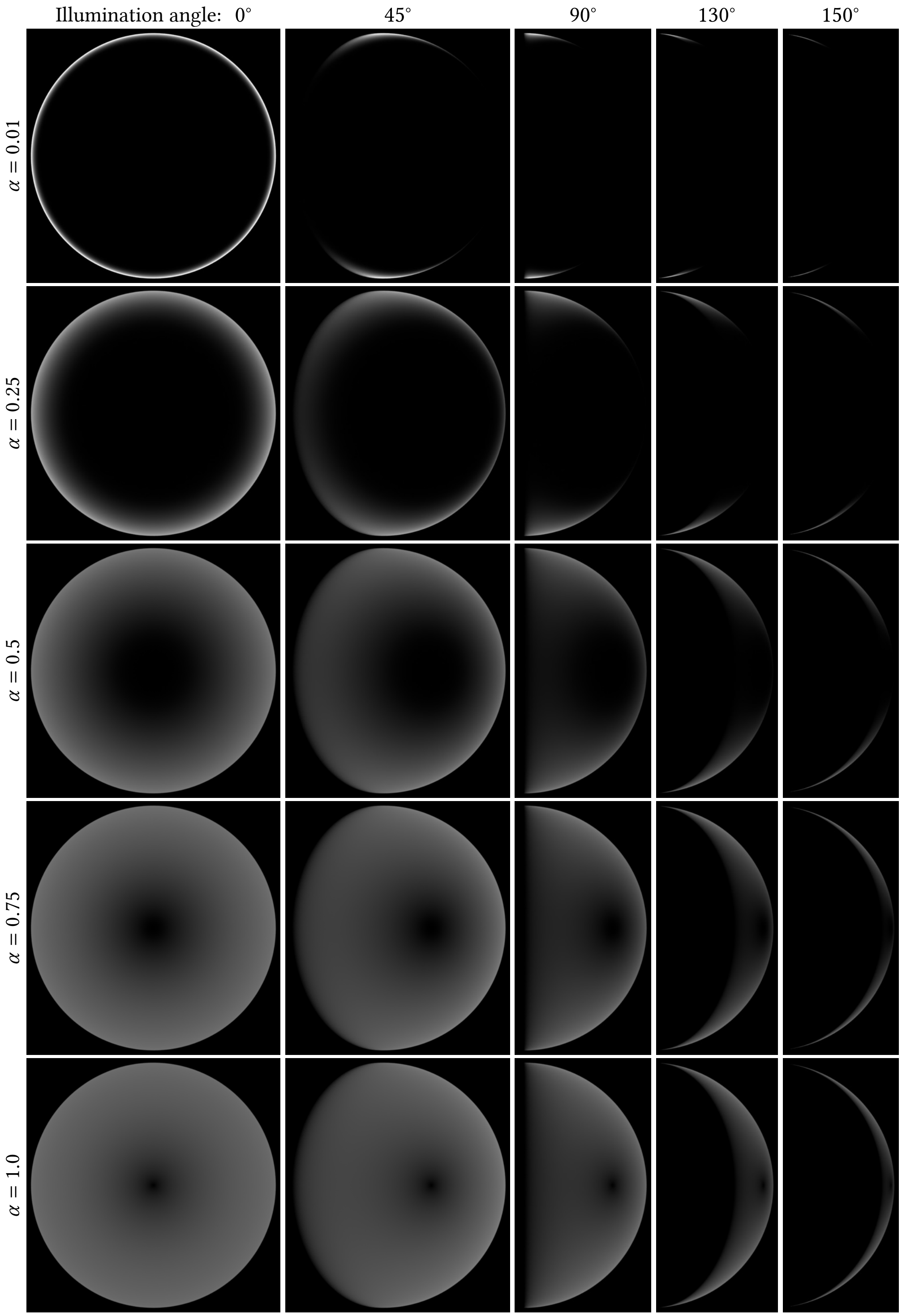

Figure 4: State-of-the-art sheen model by Conty and Kulla [2017] for varying roughness values α at different illumination angles. This is also inspired by the work of Ashikmin et al. [2000] but instead uses an exponentiated sinusoidal microfacet distribution.

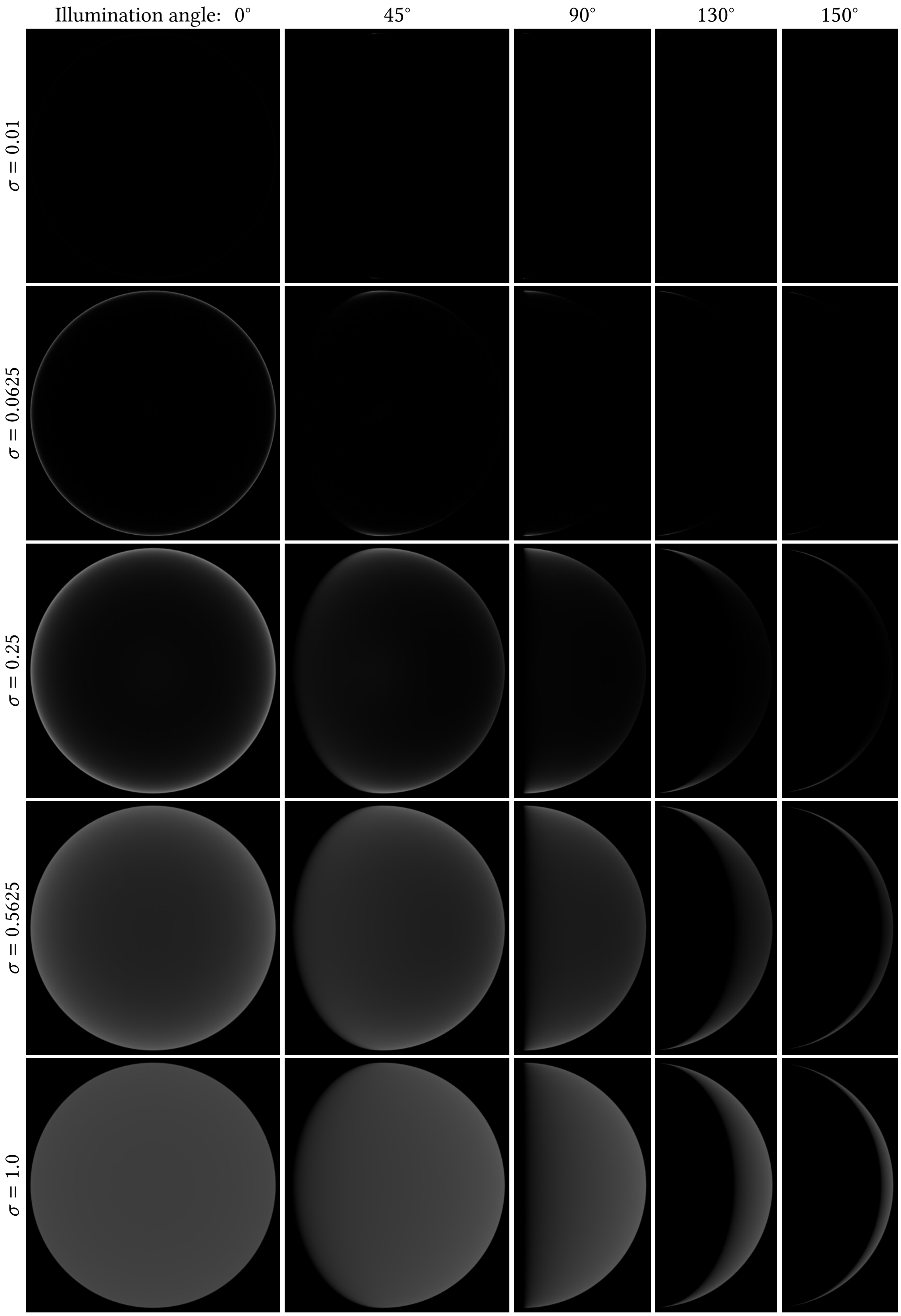

Figure 5: Sheen by Patry [2020] for varying SGGX cross section values σ at different illumination angles. This model is based on a volumetric single-scattering layer described by Koenderink and Pont [2003]—but using a fiber-like SGGX phase function [Heitz et al. 2015]. The shown volume is non-absorptive with unit density and thickness.

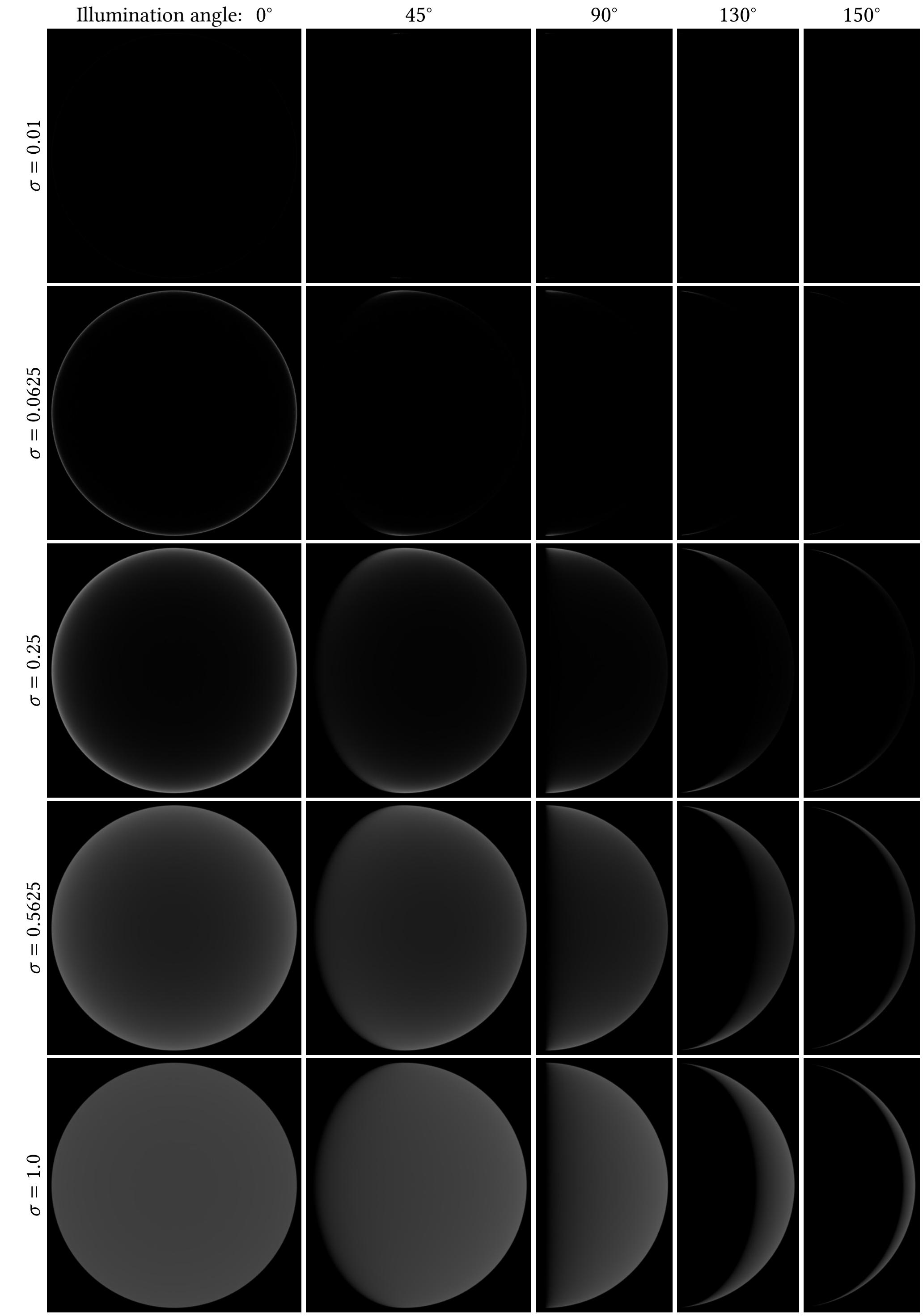

Figure 6: Single-scattering volumetric layer (non-absorptive, unit thickness, unit density) using a fiber-like SGGX phase function [Heitz et al. 2015] at different cross section values σ and illumination angles. Due to the simplicity of this model, the resulting BRDF is available in closed-form.

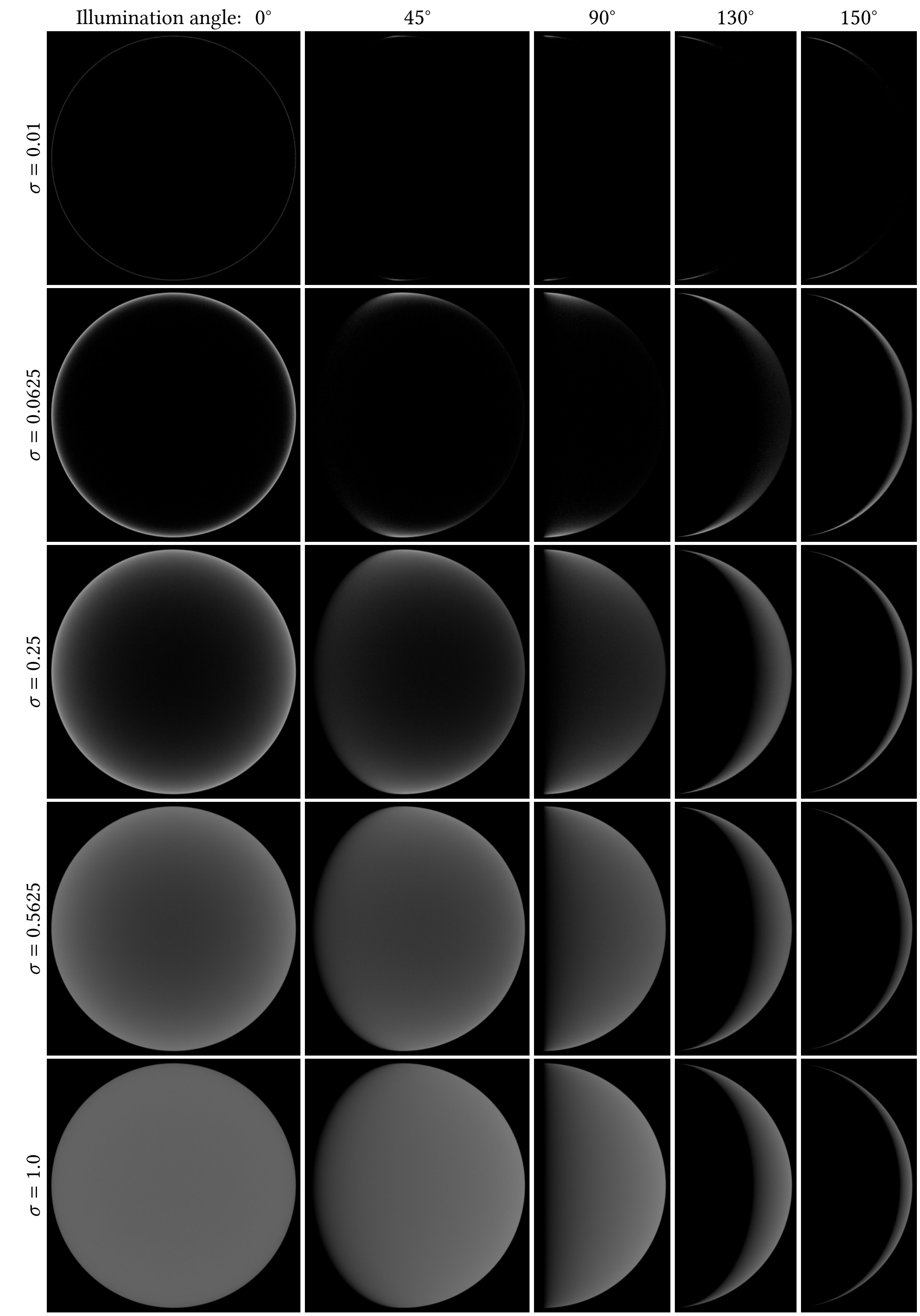

Figure 7: Multi-scattering volumetric layer (non-absorptive, unit thickness, unit density) using a fiber-like SGGX phase function [Heitz et al. 2015] at different cross section values σ and illumination angles. This forms the inspiration of our new sheen model. Due to the dominant multiple-scattering, the resulting BRDF is not available in analytic form but requires costly evaluation and sampling via a stochastic random walk [Dupuy et al. 2016].

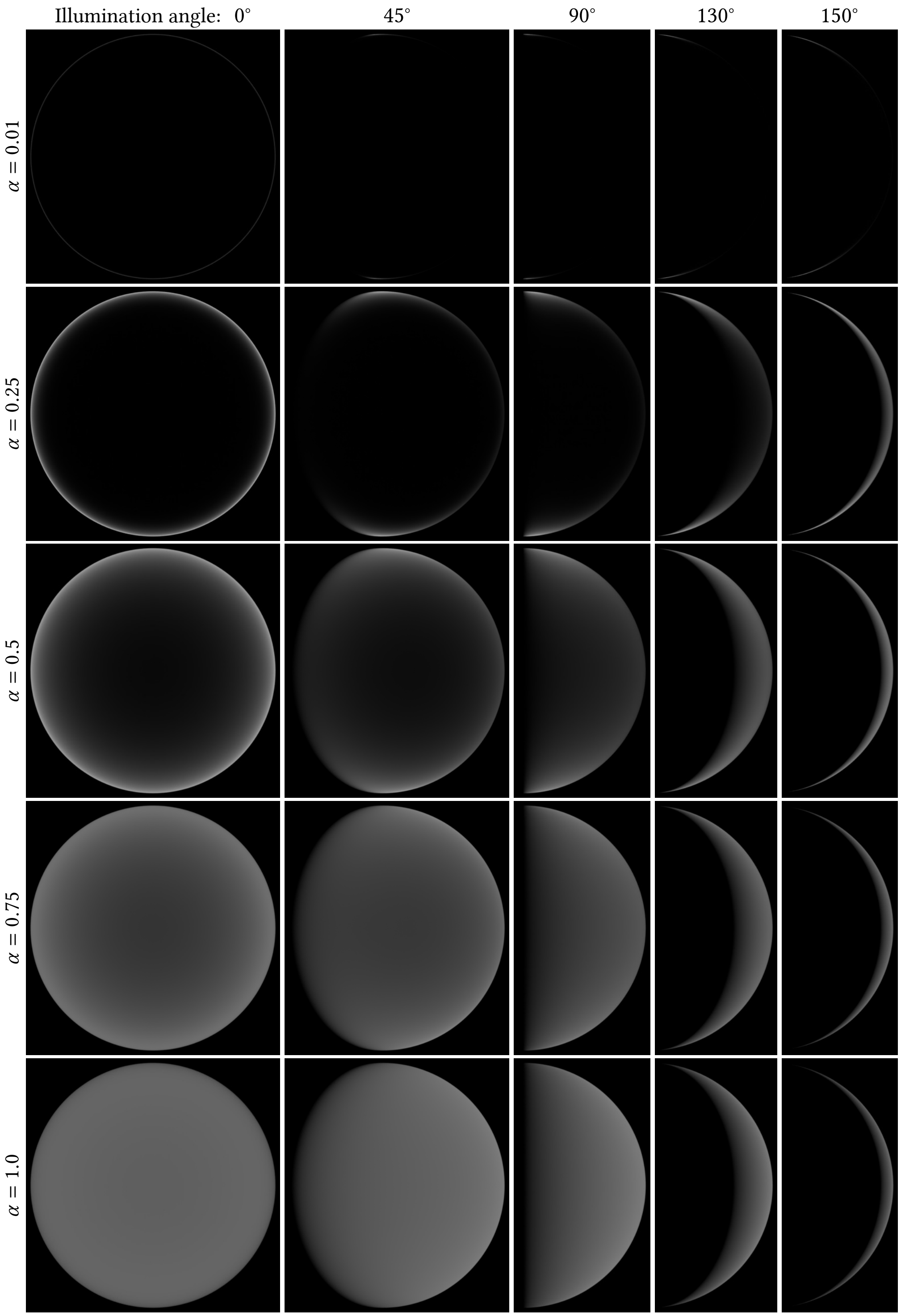

Figure 8: Our fitted LTC sheen model at various roughness values $\alpha = \sqrt{\sigma}$ and different illumination angles. It qualitatively matches the desired properties from Figure 7 but allows efficient evaluation and sampling via linearly transformed cosines (LTC) [Heitz et al. 2016].

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