Real-Time Geometric Glint Anti-Aliasing with Normal Map Filtering - Supplementary material

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1 IMPLEMENTING GGAA

Mirrored texture repetition must be activated, because only the positive part of the dictionary is stored in practice as distributions P_o are even functions. In the previous method [Chermain et al. 2020] this was not necessary, because point evaluation was restricted to the positive domain of P_o by inverting the negative components of the original half slope $\tilde{h}_o$. We also invert negative components, but now the `textureGrad`-functions are used and its associated original kernel K_o can overlap the negative domain, as illustrated in Figure 1, left. In this case, some lobes can be missed. Using the OpenGL texture parameter `GL_MIRRORED_REPEAT` instead of `GL_CLAMP_TO_BORDER` solves this issue (Figure 1, right).

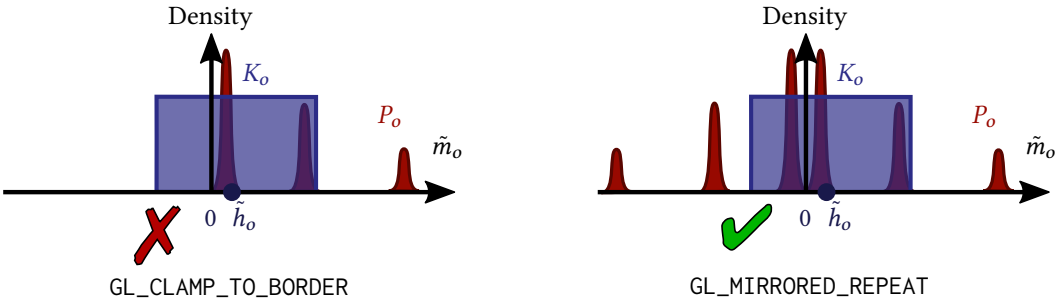

Fig. 1. When kernels K_o are used, the OpenGL texture parameter `GL_MIRRORED_REPEAT` must be used instead of `GL_CLAMP_TO_BORDER` to avoid incorrect filtering.

Conversely, using the mirrored texture repetition parameter also introduces an issue when the absolute original half slope $|\tilde{h}_o|$ and the derivatives $\Delta\tilde{h}/\Delta p$ have high values (Figure 2).

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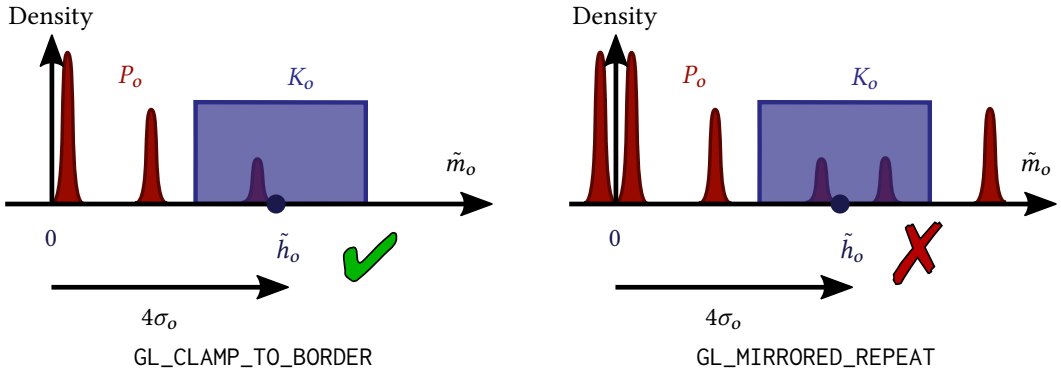

Fig. 2. The mirrored texture parameter introduces errors by infinitely repeating the distribution over its domain. Normally, after $4\sigma_o$, the distribution is zero.

In practice, this error is only possible when the kernel size is large, i.e. when derivatives in the half slope space are used. In fact, when the kernel center $\tilde{h}_o$ is greater or equal to $4\sigma_o$, the value of the distribution is set to zero. Furthermore, by using finite differences of projected half vectors $h_\perp$, the kernel size is small when the absolute half slope is high (see Tokuyoshi and Kaplanyan [Tokuyoshi and Kaplanyan 2019] for more details). Therefore, the situation in Figure 2, right, should not occur.

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