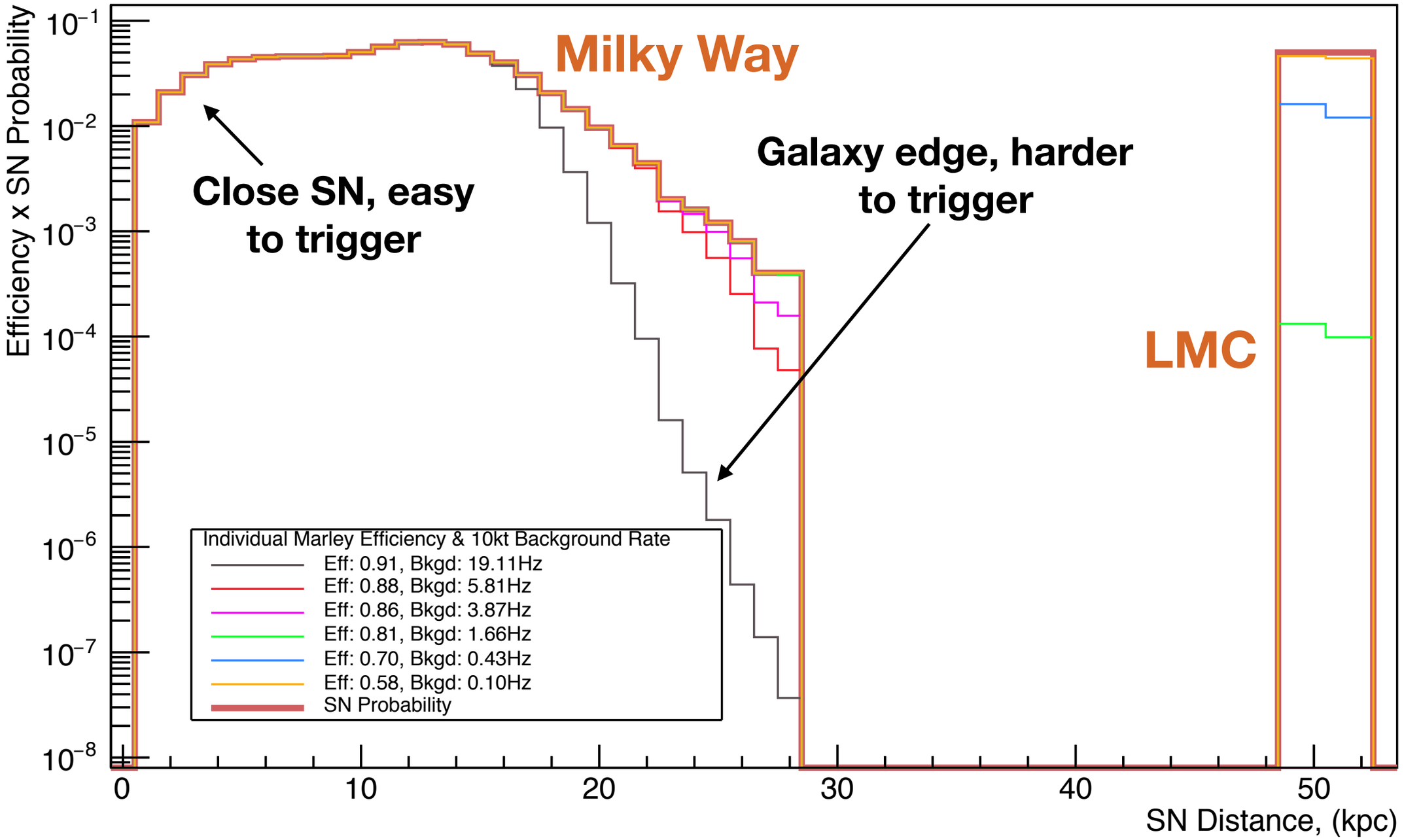
Triggering on SN Burst Neutrinos at DUNE

DEEP UNDERGROUND NEUTRINO EXPERIMENT

University of Sussex

SN / radiological / noise simulations → **Hit-clustering** → **Clustering efficiency & background acceptance different clustering configurations** → **Burst trigger**



Require larger clusters to increase sensitivity

Assuming a fake burst trigger rate of 1/month, what is our SN sensitivity vs. distance?

Galactic Neighbourhood Coverage

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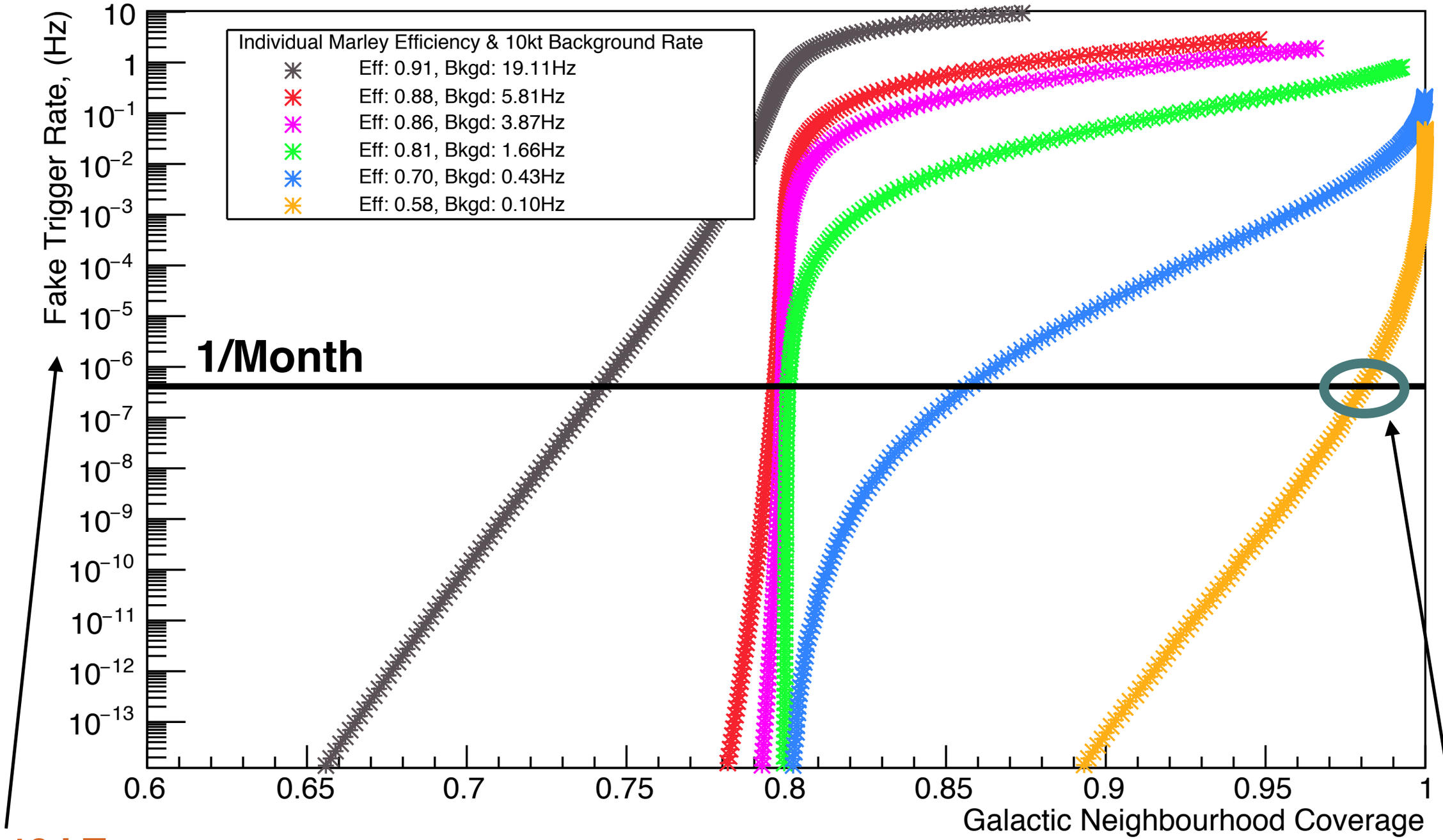
Slide 1: 1/month fake trigger rate. Trade off between efficiency and this rate?



In 10 kT

Trigger on 98% of SN in the neighbourhood, issuing 1 fake trigger per month.

Conclusion: Can trigger on nearby SN easily. Capturing 1/5 of SN coming from LMC requires more work and is more dependent on our assumptions (e.g. simulation of radiological backgrounds).