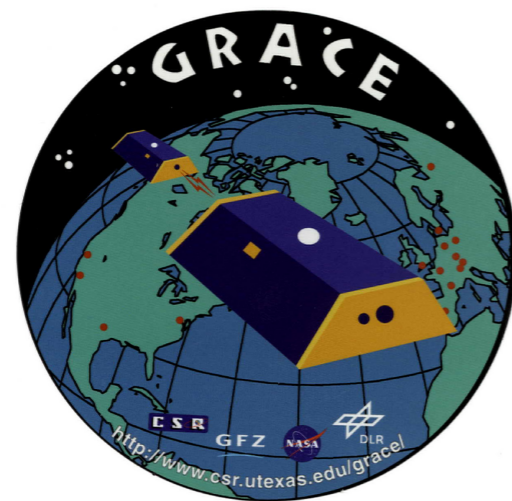
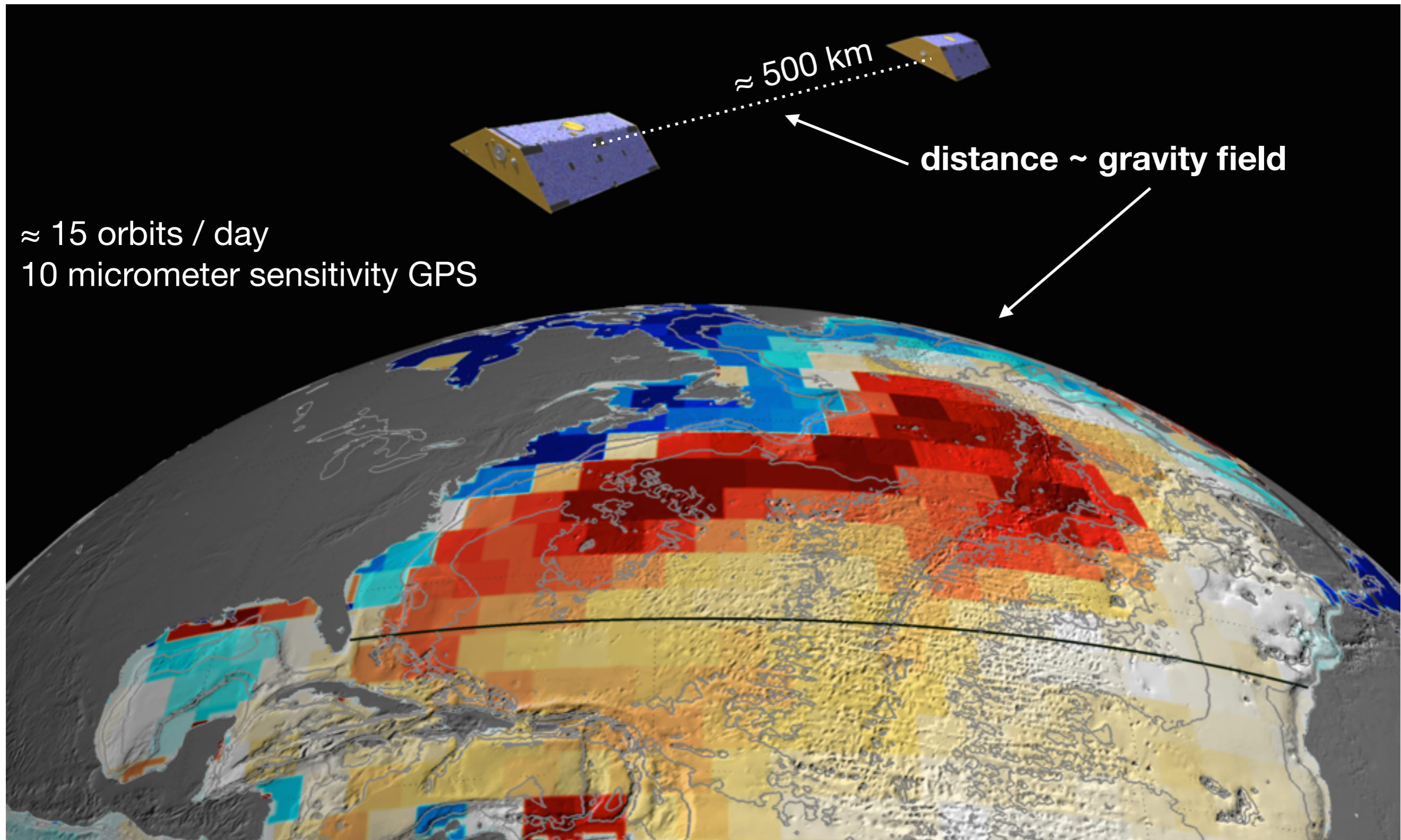


Long-term and inter-annual mass changes in the Iceland ice cap determined from GRACE gravity

Max von Hippel and Dr. Christopher Harig



Gravity Recovery and Climate Experiment 03/2002 - 10/2017



NASA/JPL-Caltech

Iceland (01/2004)

Drangajökull

Langjökull

Hofsjökull

Vatnajökull

Myrdalsjökull

Eyjafjallajökull

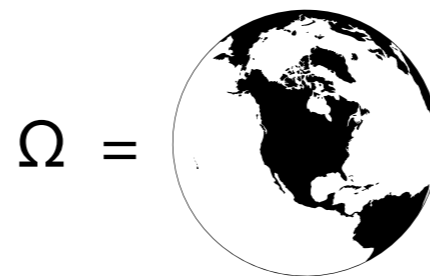
Spherical Harmonics - $Y_{lm}(r)$

$$\int_R Y_{lm}^* Y_{l'm'} d\Omega = D_{lm,l'm'}$$

- orthonormal over Ω
- not orthogonal over R

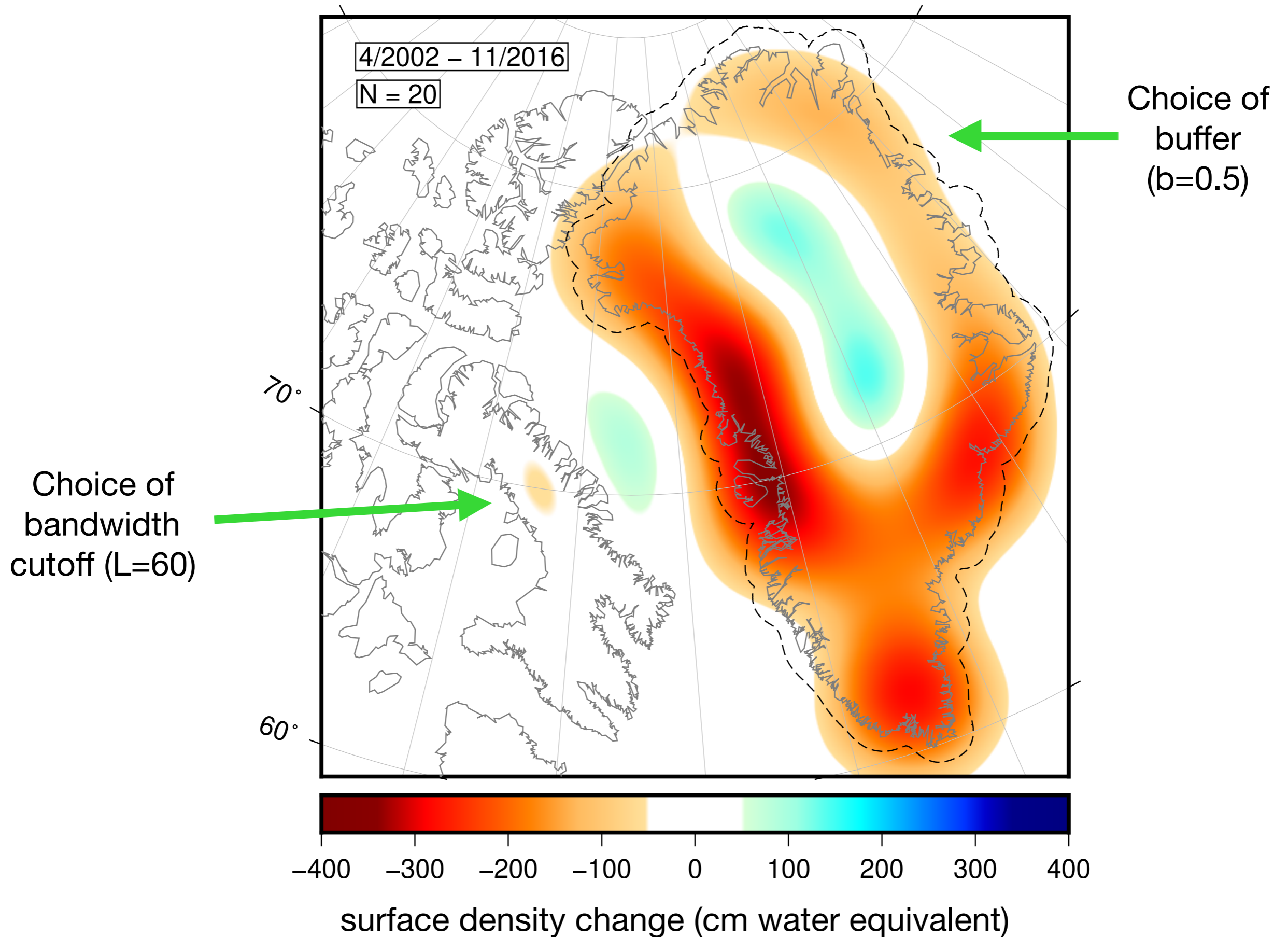
Slepian Functions - $g_a(r)$

$$\int_R g_\alpha g_\beta d\Omega = \lambda_\alpha \delta_{\alpha\beta} \quad \text{and} \quad \int_\Omega g_\alpha g_\beta d\Omega = \delta_{\alpha\beta}$$

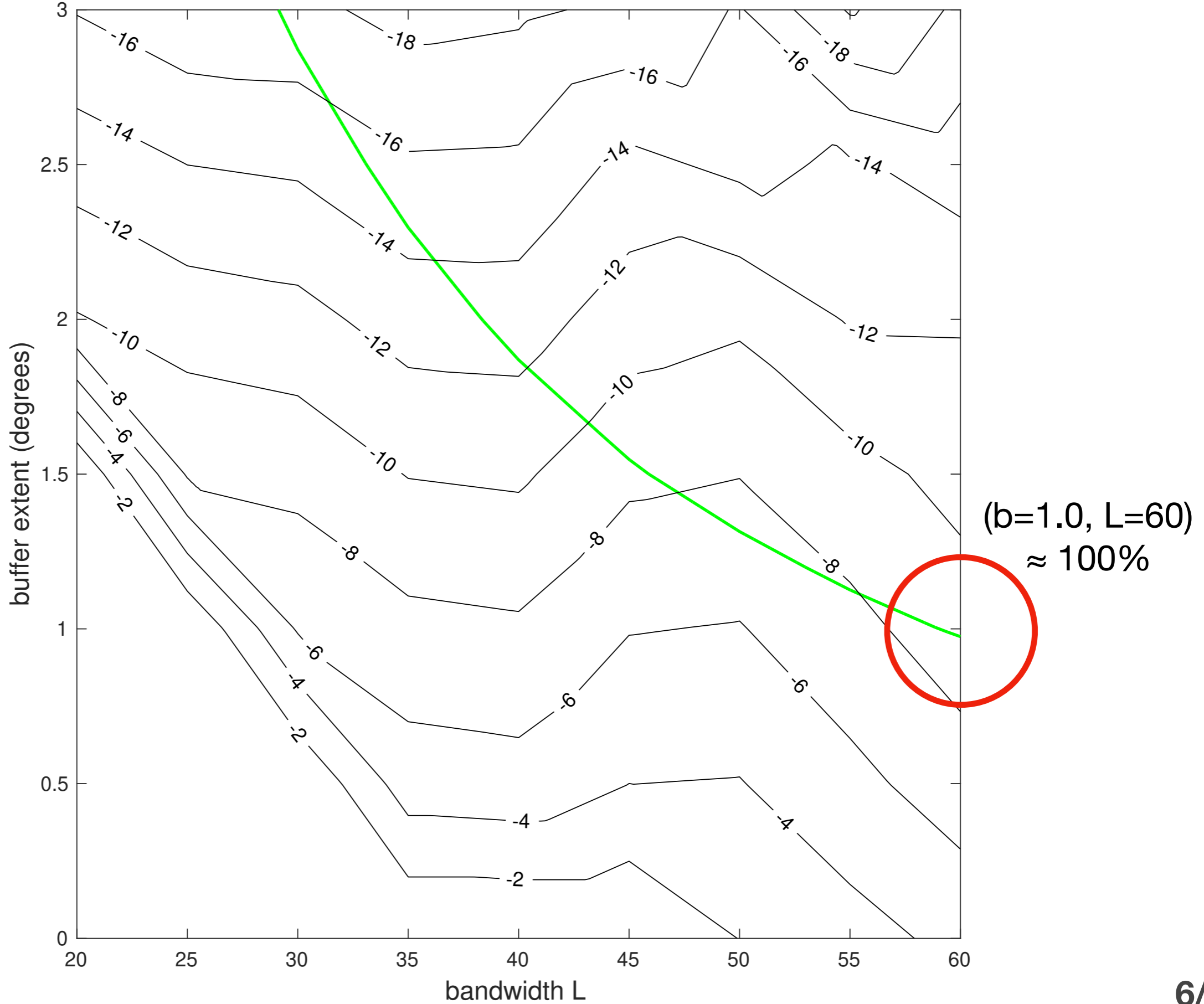


- orthonormal over Ω
- orthogonal over R

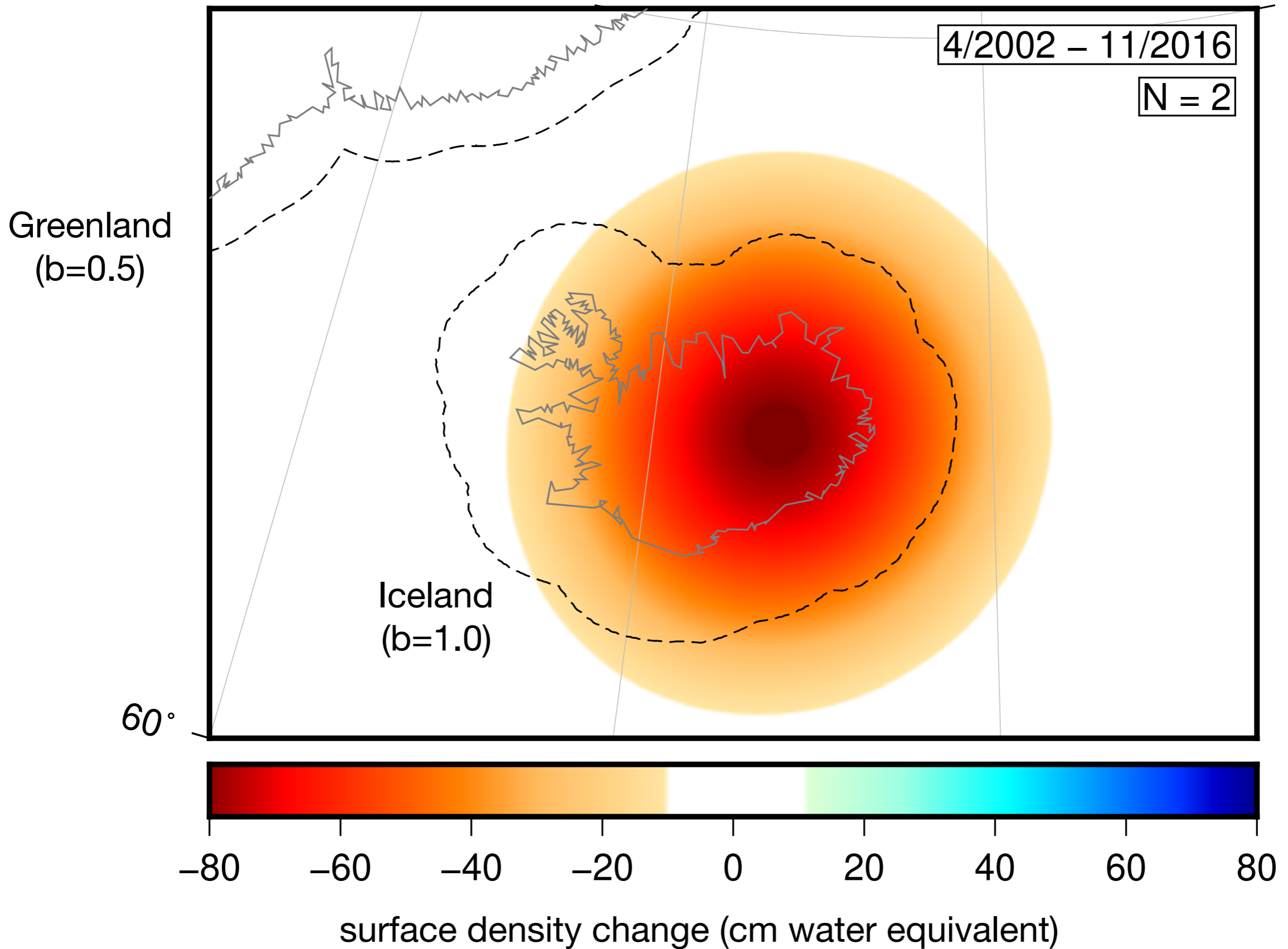
Total integrated mass change over Greenland 01/2002 - 11/2016 (L, b) = (60, 0.5)



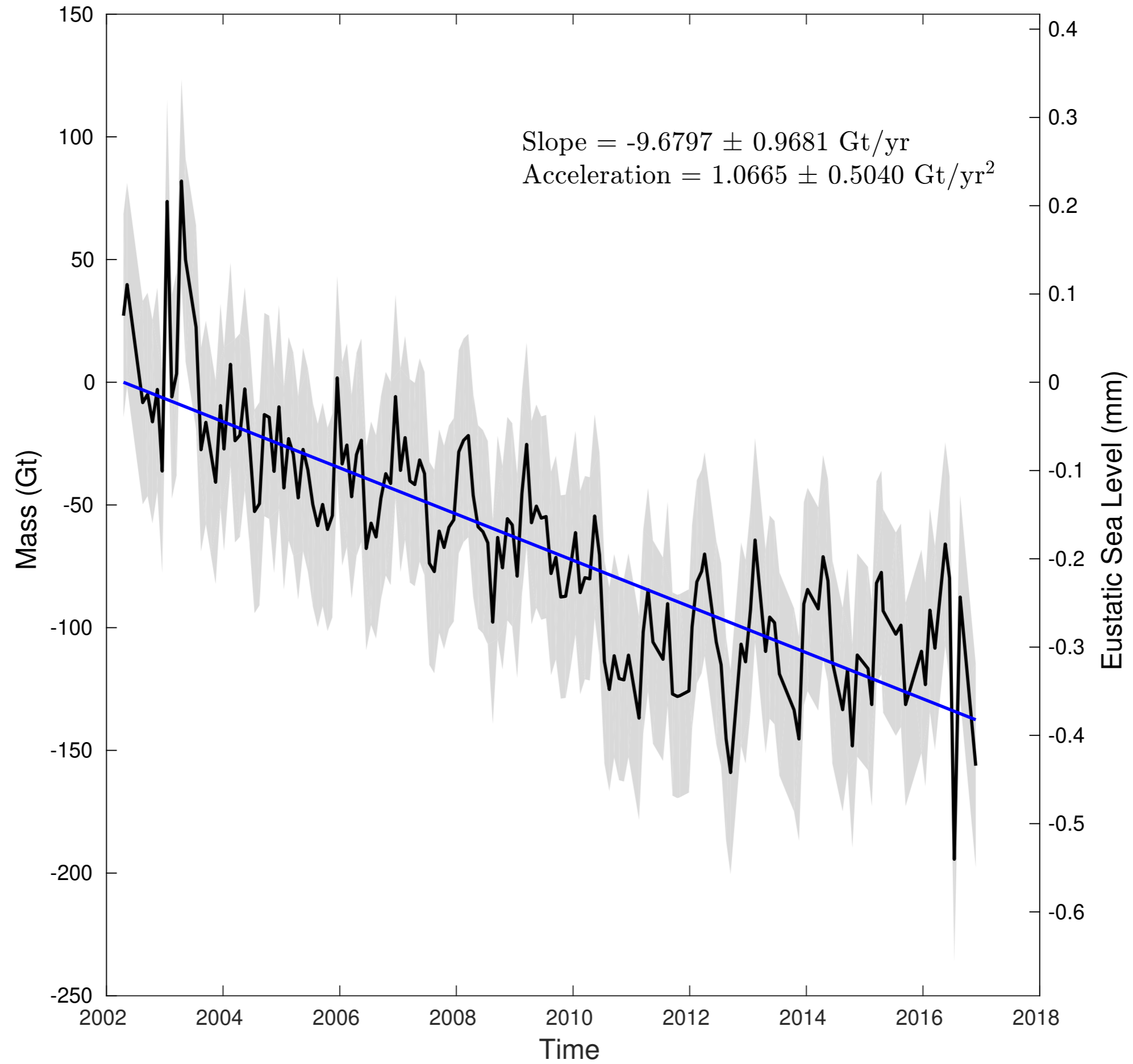
Synthetic experiment to determine optimal buffer & bandwidth



Total integrated mass change over Iceland 01/2002 - 11/2016



Integrated mass change over Iceland $\pm 2\sigma$ 01/2002 - 11/2016



Thank you!