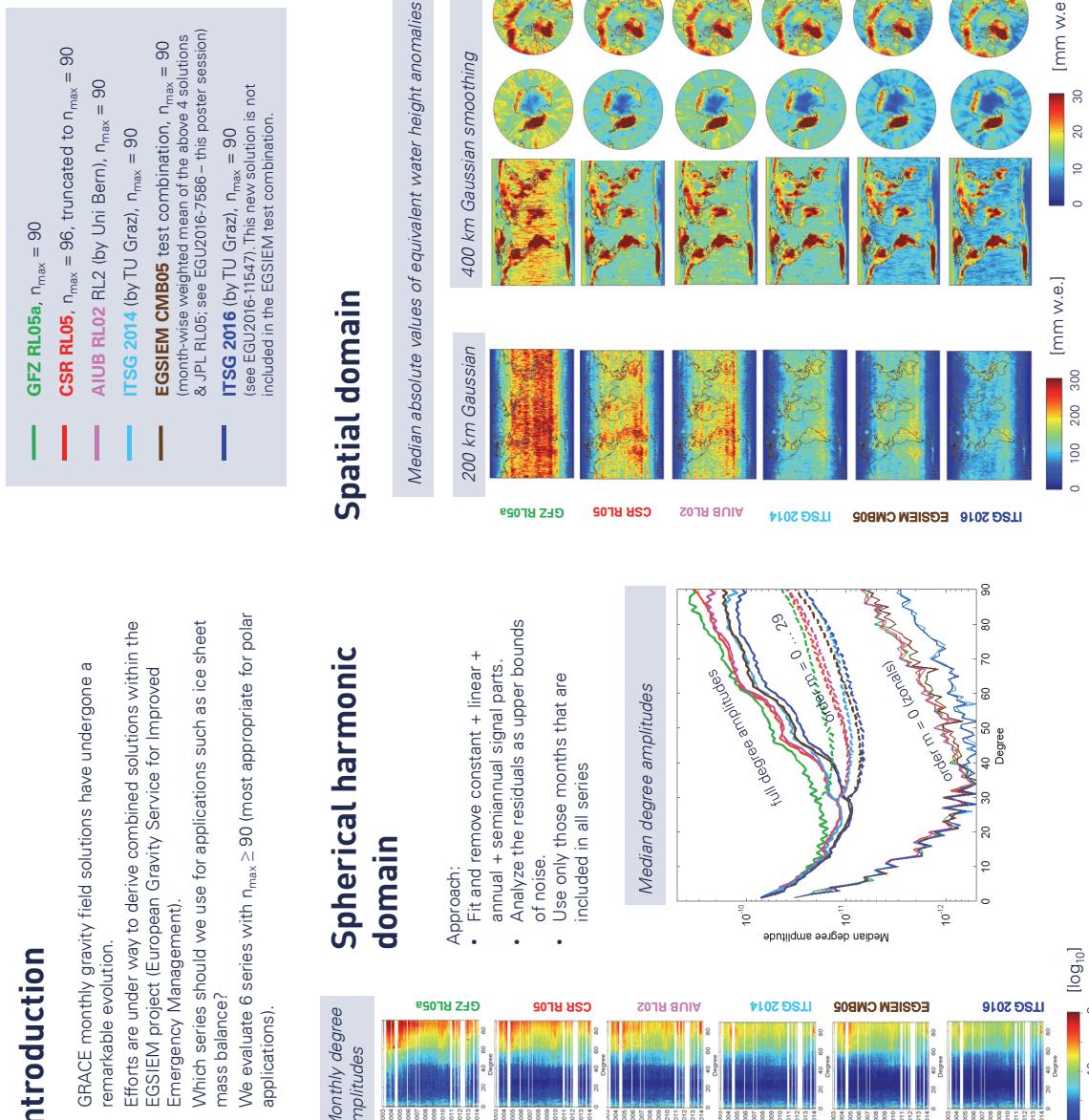


## Evaluation of recent GRACE monthly solution series with an ice sheet perspective

Introduction

- GRACE monthly gravity field solutions have undergone a remarkable evolution.
  - Efforts are under way to derive combined solutions within the EGSIEM project (European Gravity Service for Improved Emergency Management).
  - Which series should we use for applications such as ice sheet mass balance?
  - We evaluate 6 series with  $n_{\max} \geq 90$  (most appropriate for polar applications).



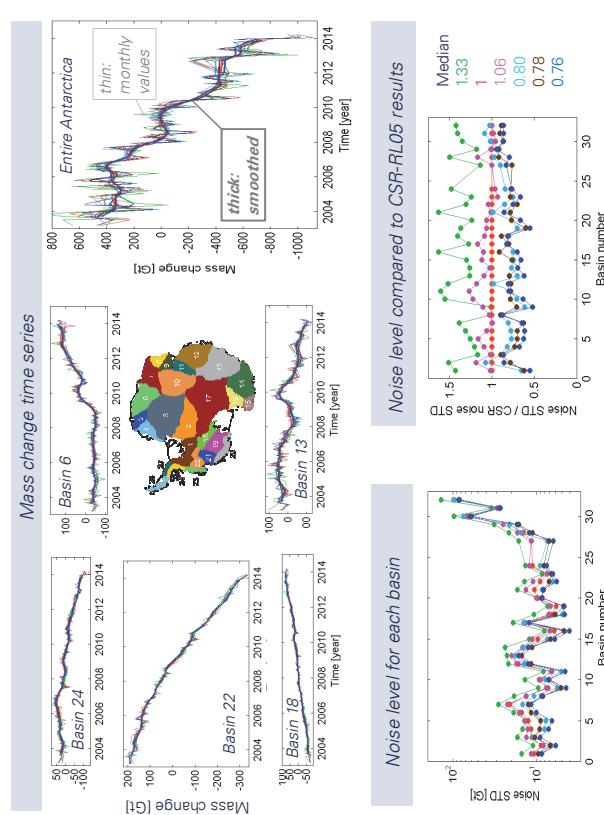
Martin Horwath<sup>1</sup>, Andreas Groh<sup>1</sup> and the EGSIEM Team

Adrian Jägg<sup>2</sup> Ulrich Meyer<sup>2</sup> Youmin Jeon<sup>2</sup> Rolf Dach<sup>2</sup> Andreja Susic<sup>2</sup> Matthias Weigelt<sup>3</sup>  
Tonie van Dam<sup>3</sup> Frank Flechtnr<sup>4</sup> Christian Gruber<sup>4</sup> Andreas Günther<sup>4</sup> Ben Gouweleau<sup>4</sup>  
Hendrik Zwenzner<sup>8</sup> Stephanie Kvaadrat<sup>5</sup> Jakob Flury<sup>6</sup> Sean Brunsma<sup>7</sup> Jean-Michel Lemoine<sup>7</sup>  
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Integrated mass changes

- Approach:**

  - Estimate ice mass changes by the regional integration method with tailored sensitivity kernels (EGU2016-12055 talk on Monday).
  - GIA correction using IUGR-R2 model.
  - Quantification of noise based on high-pass filtered month-to-month variability.



## Conclusions

- Noise levels of the different series differ by a factor of up to 2 in standard deviation.
  - ITSG 2016 and EGSIEM CMB05 show lowest noise levels.
  - EGSIEM CMB05 remarkably outperforms its individual input solutions (which do not include ITSG2016).
  - Differences in noise levels become less pronounced when noise is reduced through filtering. We find no visible difference in the signal content of the different releases. → No indication that different noise levels are associated with signal dampening.
  - Mass balance time series noise STD is about 24% lower when using ITSG 2016 instead of CSR-R05. Therefore, ITSG 2016 has been selected for ESA's Climate Change Initiative Gravimetric Mass Balance products.