



Gravitational gradients using GRACE: New opportunities for observing and understanding the Earth system

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'GRACE Gradiometer Mode' or GRACE-GM is an innovative and yet straightforward technique to process future GRACE follow-on measurements and derive gravitational gradients. Using positions, non-gravitational accelerations and attitude measurements from the identical predecessor mission GRACE, we generate common and differential mode accelerations. Consequently, we estimate GRACE gravitational gradients and we confirm their ability to detect geophysical signals over Canada, the Himalayas and Indonesia. Coherence analysis between GOCE and GRACE gradients reveals a strong match. We prove that GRACE-GM generates multispectral resolution gradients, a powerful advantage for detecting geophysical signals that cannot be sensed by GOCE. We will present case studies that exemplify the multispectral sensing capabilities of the GRACE-GM method.