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GRACE measurements show large ice mass loss in Antarctica and Greenland

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Using measurements of time variable gravity from the Gravity Recovery And Climate Experiment (GRACE) satellites we determine mass variations of the Antarctic and Greenland ice sheets during 2002-2005. We use 34 monthly GRACE gravity fields to estimate the linear trends in Greenland and Antarctic ice mass. This represents a new and independent estimate of the polar ice sheet mass balance. Both ice sheets display a large mass imbalance during the analyzed period. The mass of the Antarctica ice sheet decreases significantly from 2002 to 2005 by about $152 \pm 80 km^3/yr$. Most of this mass loss is generated by the West Antarctic Ice Sheet. The Greenland ice sheet display significant mass loss in the period from Apr 2002 to July 2005, of about $162 \pm 22 km^3/yr$ mass loss. Our uncertainty estimates for both Greenland and Antarctica are dominated by the effects of GRACE measurement errors and errors in our post glacial rebound correction.