

Global Economic Impacts of Severe Space Weather

Topic: World input-output modeling and databases III

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Coronal mass ejections (CMEs) strong enough to create electromagnetic effects at latitudes below the auroral oval are frequent events, and could have substantial impacts on electrical grids. Modern society's heavy reliance on these domestic and international networks increases our susceptibility to such a severe Space Weather event. Using a new high-resolution model of the global economy we simulate the economic impact of large CMEs for 3 different planetary orientations. We account for the economic impacts within the countries directly affected as well as the post-disaster economic shock in partner economies through international trade. For the CMEs modeled the total global economic impacts would range from ~ US \$ 380 billion to US \$ 1 trillion. Of this total economic shock ~ 50 % would be felt in countries outside the zone of direct impact, leading to a loss in global GDP of ~ 0.1 - 1 %. A severe Space Weather event could lead to global economic damages of the same order as other weather disasters, climate change and extreme financial crisis.