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Comparison of solar wind driving of the aurora in the two hemispheres due to the solar wind dynamo

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Event studies of simultaneous global imaging of the aurora in both hemispheres have suggested that an asymmetry of the solar wind driving between the two hemispheres could explain observations of non-conjugate aurora during specific driving conditions. North-South asymmetries in energy transfer from the solar wind across the magnetopause is believed to depend upon the dipole tilt angle and the x-component of the interplanetary magnetic field (IMF). Both negative tilt (winter North) and negative IMF B_x is expected to enhance the efficiency of the solar wind dynamo in the Northern Hemisphere. By the same token, positive tilt and IMF B_x is expected to enhance the solar wind dynamo efficiency in the Southern Hemisphere. We show a statistical study of the auroral response from both hemispheres using global imaging where we compare results during both favourable and not favourable conditions in each hemisphere. By this study we will address the question of general impact on auroral hemispheric asymmetries by this mechanism – the asymmetric solar wind dynamo. We use data from the Wideband Imaging Camera on the IMAGE spacecraft which during its lifetime from 2000-2005 covered both hemispheres. To ease comparison of the two hemispheres, seasonal differences in auroral brightness is removed as far as data coverage allows by only using events having small dipole tilt angles. Hence, the IMF B_x is expected to be the controlling parameter for the hemispheric preference of strongest solar wind dynamo efficiency in our dataset. Preliminary statistical results indicate the expected opposite behaviour in the two hemispheres, however, the effect is believed to be weak.