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Coordinated space weather observations at the SANAE IV base in Antarctica

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The proposed ionising influence of cosmic rays on atmospheric aerosols, clouds and atmospheric electrical properties has resulted in several attempts to obtain convincing correlations. Several theoretical studies on such possible indirect influence is still poorly understood while the observational evidence remains controversial and incomplete. This study examines the Heliospheric-Magnetospheric-Atmospheric responses during a recent fortuitous cosmic rays Forbush decrease (FD) that occurred on 16-17 July 2017. The varied instrumentation located on SANAE IV in Antarctica provided us an opportunity to test the different theories applied to cosmic ray influence. Various ground based instruments located in South Africa, belonging to South Africa National Space agency, are used to coordinate FD-atmospheric connection hypothesis. A synthesis of multiple observations indicates that there is a plausible link between cosmic ray ionisation and polar aerosols, but clouds.

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