FINE TIME RESOLUTION ANALYSIS OF THE 14 JULY 2000 GLE

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A Ground Level Enhancement occurred on 14 July 2000 and was observed by at least 18 stations in the world-wide neutron monitor network. Earliest onset was observed between 10.30 and 10.35 UT at several stations. The event is assocaited with an X5.8 solar flare (importance 3B) from active region 9077 that commenced at 10.03 UT, reached its peak at 10.24 UT and ended at 10.43 UT. The largest neutron monitor response was observed at South Pole with a maximum 58.3% above the pre-increase level in 1-minute data.

Comparison of Mt. Wellington observations with those of Hobart and the new monitor at Kingston led to a derived attenuation length for the GLE of $110\,\mathrm{g\,cm^{-2}}$.

Analysis of the enhancement using the established technique described by Cramp et al. (1997) has been undertaken for every 5-minute interval from 10.30 UT to 20.00 UT using data from 25 stations. The spectrum was fitted with a simple power law and initially had a slope of around -6, softening throughout the event to around -9. At onset the particle arrival was quite anisotropic but tended to increasing isotropy for an hour or more. Later in the event, when only low energy protons remained, the pitch angle distribution became highly anisotropic again. The "arrival direction" of the particles also changed markedly between 11.00 and 11.10 UT but varied only slowly before and after that transition.

Cramp, J.L., Duldig, M.L., Flückiger, E.O., Humble, J.E., Shea, M.A. and Smart, D.F., JGR 102, 24237-24248