Carcass Island: A new site for the observation of Southern South American dust in the western Falkland Islands

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Dust originating in Southern South America (SSA) is probably the largest source of mineral matter and its associated trace elements to the remote South Atlantic and Atlantic sector of the Southern Ocean. Antarctic ice core records show very large variations in dust supply over glacial – interglacial timescales, which may be related to changes in atmospheric pCO_2 and temperature proxies.

Our understanding of the current strength and transport of SSA dust sources is very poor however, partly because persistent cloud cover makes remote sensing observations in the region difficult, but also due to a lack of observations of surface level dust concentrations along transport pathways.

In September 2010 we established a new site for the collection of SSA dust on Carcass Island (51°15'S, 60°35'W) in the western Falkland Islands, as part of the UK contribution to the GEOTRACES programme. Weekly aerosol samples were collected at the site between September 2010 and April 2011, using a high-volume sampler under the control of a wind sector monitor ("clean" sector 220-310 degrees, relative to true north). The collector was mounted at the top of a short (~3m) aluminium scaffolding tower near the crest of a small ridge approximately 400m from the shore. The nearest settlement is >3km downwind of the site. During site visits rain samples were also collected either at the aerosol site or settlement.

Samples will be analysed for their soluble and total trace metal content and major ions (including macronutrient) chemistry. We intend to operate the site in future years.

This contribution will describe the Carcass Island site in detail and we hope to be able to present preliminary results from the first year of sampling.

High-pressure Mössbauer Spectroscopic study of Lohawat (Howardite) meteorite up to 9GPa

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The effect of high-pressure on Lohawat(Howardite) Meteorite which fell at Lohawat village in Jodhpur was studied using Mössbauer spectroscopic technique with diamond anvil cell and 4:1 methanol:ethanol mixture as hydrostatic pressure medium[1]. The main minerals detected in the meteorite were orthopyroxenes and plagioclase with little amount of olivine. Ambient Mössbauer study showed ferrosilite with Fe^{2+} in two inequivalent octahedral sites M1 and M2 [2]. Both the sites behave differently under pressure.At 2.8 GPa, a sudden decrease in Mössbauer parameters (quadrupole splitting and isomer shift) indicate transformation of high spin Fe^{2+} to low spin configuration. The trend of decrement continues up to 5.6 GPa where isomer shift reaches a low of -0.14 mm/s . Further increase in pressure reverses the trend and at 8.4 GPa the value becomes +0.05mm/s. The observation of low spin Fe^{2+} configuration in pyroxene is unusual , not observed in terrestrial samples. Such a behaviour resembles post-peovskite character which occurs at ~ 120 GPa [3]. The presence of low spin Fe^{2+} phase at low pressure of ~ 2GPa indicates the defects generated in the system under shock impact. The results thus obtained are also supported by high pressure electrical resistivity measurements.

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[1] Chandra U., Ind. J. (2007) *Pure & Appl. Phys.*.**45** 790.
[2] Tripathi R.P. *et al*. (2000) *Meter. & Planet. Sc*. **35** 201.
[3] McCammon *et al*. (2010) *PEPI* **180** 215.