We thank David Ferris and Jihong Cole-Dai their comments, and respond to these below.

We would first like to ask for clarification on the core(s) used for this record. There have been several ice cores from Law Dome. The record presented by Palmer et al. (2001, 2002) was from DSS cores drilled in the 1990s. This discussion paper mentions a core drilled in 2005. An explicit statement on which core(s) are used to construct this volcanic record would eliminate any possibility for confusion among the cores.

Six separate ice cores from the DSS site were used in this study. The ice cores were retrieved from DSS site (66°43'S 112°48'E). Drilling for the main 1196 metre-long DSS ice core began in 1987, with drilling completed in 1993. Two additional mid-length cores (DSS97 and DSS99) were drilled in subsequent years at the site to correct for inconsistencies in the data from the top 117 m of the original DSS core. In recent years (since 1999) the DSS site has been revisited and series of short overlapping firn cores were drilled in 2001, 2008 and 2009 (cores DSS0102, DSS0809 and DSS0910 respectively) to bring the record up to 2009. Palmer at al., (2001) produced a single chemistry time series from DSS99, DSS97 and DSS down to 400 m (1300 CE), and have applied their methods to update the Law Dome chemistry record from 1995 to 2009, and extend the chemistry time series to 23 BCE. We have included a table in supplementary material with further details.

We would like to point out that two volcanic events (SP04C5-14 & 15), separated by five years dated as 1448 & 1453, were reported in the South Pole core (the SP04C5 record) by Ferris et al. (2011). The larger and later (1453) event was attributed to the Kuwae eruption. We believe it is important to recognize that there is strong evidence of two volcanic eruptions in the 1450s in both Greenland and Antarctica ice core records supporting the author's argument of two low latitude eruptions in that decade with climatic implications.

We have extended our discussion on SH volcanic signals during the 1450s, and that includes specific mention of the two signals in the South Pole record (Ferris et al., 2011) and also the possible volcanic signal in the Siple Station ice core (Cole-Dai et al., 1997). However, we note that many SH ice cores (e.g. DML, G15, PS1, Plateau Remote, SP2001C1, Talos Dome, DT-401) (Traufetter et al., 2004; Moore et al., 1991; Delmas et al., 1992; Cole-Dai et al., 2000; Budner & Cole-Dai, 2003; Stenni et al., 2001; Ren et al., 2010) do not show this double signature. We cannot conclusively say the 1448 SP04C5 signal is the 1453 NGRIP event, and ideally further work would be conducted (e.g. chemical analysis) to investigate the link. We are confident in saying it is NH-dominant however, given that two signals have been identified in several NH ice cores.

The last comment relates to vagueness in the statement beginning in line 2 and continuing to line 13 on Page 1573 concerning nssSO42- residual calculations. It is unclear to us whether the running mean being subtracted is a 31 year running mean of annual averages or 31 year running means of 8 individual bins per year. It would seem that subtracting a near constant (31-yr nssSO42- moving annual average) from the raw data would have no effect on the annual cycles and that the start of a volcanic event could still be masked if occurring during a winter.

The running mean used in the residual calculations is the 31-yr running mean of the 8 individual bins, and we have reworded this section for clarity.

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