We would like to than anonymous reviewer #2 for their comments, and address the major points raised.

1) In the abstract (Ln. 11-14 in P. 1569) How does the good agreement between Law Dome and NGRIP make the former "the most accurately dated Antarctic volcanic dataset"? Is the use of single NH ice core sufficient to make such a statement?

The NGRIP ice core is on the GICC05 timescale, which was produced from three ice cores; NGRIP, DYE-3 and GRIP (Vinther et al., 2006). All ice cores are dated through our period of interest by annual layer counting. From these three cores, only NGRIP has sulphate data available in the period covered by our record, therefore comparisons with our sulphate record have centered on that core.

2) In the last paragraph of the Introduction, the authors used "the ice cores" implying multiple cores were used in this reconstruction. If that is the case, general information of the individual cores and how the volcanic time series were combined should be provided.

The Dome Summit South (DSS) site (66°43'11'' S 112°48'25'' E) is located 4.6km southeast of the Law Dome summit, and was drilled for the 1196 metre-long DSS main ice core in 1987 CE, with drilling completed in 1993 CE. 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 117m of the original DSS main core. In recent years (since 1999 CE) the DSS site has been revisited and series of short overlapping firn cores were drilled in 2001, 2008 and 2009 CE (cores DSS0102, DSS0809 and DSS0910 respectively) to bring the record up to 2009 CE. Palmer at al., 2001 produced a single chemistry time series from DSS99, DSS97 and DSS down to 400m (1300 CE), and we have applied their methods to extend the Law Dome chemistry record from 1995 CE to 2009 CE. All cores used were dated via annual layer counting. Dating is registered across core boundaries by matching seasonal features in oxygen isotopes and other chemistry species through the periods of overlap between cores. Dating across core boundaries is unambiguous and locked without error. In the event of misalignment of overlapping records, natural variability in accumulation from year to year would result in rapid loss of coherence between annual cycles.

3) In determination of volcanic signals, the phrase "visual study" needed to be clearly described and better justified by providing the criteria, etc. In addition, in calculating the residual nssSO42-, how does the 31-yr running mean help to remove the seasonality of biogenic sulfate?

Volcanic identification by visual examination of sulphate chemistry was performed on the Law Dome record between 1995 and 1300 CE by Palmer et al., 2001. We have extended the identification beyond this time period using their methods, with a minor alteration. We calculated the residual sulphate record by subtracting the 31-yr mean seasonal cycle before identification of events, whereas Palmer et al., 2001 visually compared the nss-sulphate time series to the 700 yr (1995-1300 CE) mean nss-sulphate seasonal cycle. Both this study and Palmer et al., 2001 defined volcanic events as departures above the mean seasonal average. Additionally, we placed a 6 month duration requirement threshold on volcanic events. The residual sulphate was calculated to make volcanic identification easier, by removing the seasonal biogenic sulphate cycles present in the Law Dome sulphate record. The biogenic cycles follow a uniform distribution cycle throughout the year. We divided each annual cycle into 8 uniform bins, and calculated mean bin values across the 31-yr time period. The residual sulphate was calculated from a 31 year running mean for each of the 8 bins per year (not a 30 year running mean of the annual average). We used 8 bins per year, instead of 12 as used by Palmer et al., (2001) due to reduced layer thickness at depth resulting in fewer samples per year.

4) In line 24 of page 1578 the authors mentioned that "there is a small gap in trace chemistry during this period". Could the authors be more specific about this gap in terms of trace chemistry and duration of the gap? Since it is a critical time frame, does the gap affect the main argument the authors tried to make about the timing of the Kuwae eruption?

There is a 10-month gap in trace ion chemistry from 1452.3 to 1453.1 CE. This is longer than our 6-month minimum window; therefore we cannot rule out the possibility of a volcanic eruption during this period. However, there are no indications of a volcanic signal (elevated non sea-salt sulphate) present either side of this gap, as there were with the 229 CE event. If a volcanic event were to have occurred in this time period, it would be a small eruption, considerably smaller than the postulated size of the Kuwae volcanic event. Dating through this period has not been degraded, as continuous oxygen isotope and hydrogen peroxide data is available, showing clear, unambiguous seasonal cycles.

5) The proposal of two volcanic eruptions during 1450 and 1460 (in NH) was made by previous studies, so it is not original to this work. In addition, in suggesting there are two individual eruptions during the decade, how would one explain the missing of the second signal in several of the sulfate and the majority ECM ice-core-records, as shown in Fig. 3&4 of the Gao et al [2007] study?

The possibility of two eruptions has been previously considered, however, this ice core is the first SH core with sufficient resolution and dating accuracy to resolve the timing of the large 1450s CE event. The presently best-dated records DML and South Pole (Traufetter et al., 2004; Ferris et al., 2011) are unable to resolve the timing of 1453 or 1458 CE, due to uncertainties in their respective timescales. The reasons why different ice cores capture volcanic signals differently are not fully understood. The location of the ice core relative to the volcanic centre, post depositional processes and the specific ice core analysis methods may all be factors. However, the factors dictating the presence or absence of a specific volcanic signal in each ice core was not investigated as we consider this is outside the scope of this paper, where our focus was on the timing of the large global volcanic horizon.

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