

Interactive comment on “Large scale changes in 20th century black carbon deposition to Antarctica” by M. M. Bisiaux et al.

Anonymous Referee #3

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The authors present two centennial-length records of black carbon from Antarctic shallow drilling sites, identifying dominant periodicities in the records and attributing such changes to changing practices of continental fire management and fossil fuel burning. The literature cited is relevant and up-to-date, with the exception of historical fire emission data. While there is scope to improve the interpretation, the measurements are of high quality and the data is of interest. I find that the manuscript is, apart from some grammatical errors, ultimately suitable for publication after minor revisions.

Specific comments:

27818-line 11. These should be specified as ice-equivalent accumulations

27819-line 22. The geomeans should be 0.08 and 0.09, at least according to Fig1...

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27822-lines 5-26. The evaluation of historical fire emission data is quite limited. The authors claim "common variability" in the records between the 1950's and 1980's but don't really address what this means for the period between 1850 and 1950. Since this is the first high-resolution BC record for Antarctica, the authors should put more effort into understanding how much of the variability is due to ENSO and how much is due to source changes, and more adequately link source changes to the Antarctic sinks. If the majority of dust deposited in Antarctica originates from South America, shouldn't more effort be made to characterize South American fire history? In figure 4 I would expect at least one reconstruction of ENSO variability to be shown. At the end of the discussion, it seems that the authors are arguing that the ice core pattern is due to ENSO (transport) rather than source changes?

Technical corrections:

27818-line 20. Spelling: "SP2, Droplet..."

27820-line21: Grammar: "at for"

27827 - footnote a: "outlier"

27831 - it would be good to write on the figure that a is WAIS and b is Law Dome.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 27815, 2011.

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