

Interactive comment on “On the occurrence of annual layers in Dome Fuji ice core early Holocene ice” by A. Svensson et al.

F. Parrenin (Referee)

parrenin@ujf-grenoble.fr

Received and published: 4 May 2015

This manuscript presents an analysis of annual layers in a 5 m thick section of the Dome Fuji ice core during the Early Holocene period, as well as a synchronization of this section to the EDML and NGRIP ice cores by the mean of three common volcanic events.

The main conclusions are that:

- 1) it is possible to count annual layers in this section with a typical uncertainty of ~10%
- 2) there are three common volcanic spikes with the EDML and NGRIP ice cores in the age interval

C302

3) the results of the layer counting are compatible with the EDML and NGRIP layer counted chronologies

4) among the three volcanic spikes, 2 have corresponding high dust concentrations (tephra layers)

5) there is a so-called 'peculiar event' in the bottom part of the section, where the variations of the various proxies are very small. This event is suggested to be due either to snow redeposition by wind (sastrugi) or to a high precipitation event (blocking event).

6) the accumulation rate (3.0 ± 0.3) is slightly higher than what can be deduced from ice isotopes

This manuscript is useful for two reasons. First, it informs us on the snow accumulation process in central East Antarctica. In my opinion this is the most important aspect of the manuscript but it is not emphasized in the abstract. Second, it opens an interesting perspective on the annual counting of the Eemian section of the Dome Fuji ice core, a period for which we currently don't know the duration better than a few kyr. For the second point, I have a question that the authors might want to discuss in the manuscript. What is the best location in Antarctica for counting the Eemian? There is a compromise to be found between a high accumulation rate and a high thinning factor, so this question is not completely trivial. Is Dome Fuji really among the best locations?

The manuscript is clear and concise so I have very few technical comments.

- abstract: the conclusions regarding the accumulation process at DF should be emphasized here.

- p. 812, l. 9: Note that Parrenin et al. (CP, 2007) also found that the accumulation at DC during the Early Holocene period was larger than what can be inferred from the ice isotopes. I therefore suggest to add to this sentence: '..., in agreement with what was inferred at EPICA Dome C (Parrenin et al., 2007).'

C303

- p. 815, l. 2: the 'peculiar event' is now called 'P3 tail event'. Please use a consistent denomination.

- p. 815, l. 3-13: I suggest to start this paragraph with 'Another possible explanation for the event is related to unusual meteorological conditions'. Then, the fact that it might be related to the volcanic event is only a sub-hypothesis inside this 'meteorological' hypothesis.

- p. 815, l. 19-21: remove this sentence this the 'peculiar event' is already described in the following paragraph.

- figure 1: there are strange grey lines in this figure that are not described in the legend.

Interactive comment on *Clim. Past Discuss.*, 11, 805, 2015.