

Interactive comment on “Glaciological characteristics in the Dome Fuji region and new assessment for 1.5 Ma old ice” by Nanna B. Karlsson et al.

Anonymous Referee #3

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This manuscript provides a new glaciological information (ice thickness, bedrock, topography, GHF, basal condition etc.) of the Dome Fuji area on the base on airborne radar surveys conducted during the 2014/15 and 2016/17 Antarctic season. An accurate geophysical survey is prerequisite for any paleoclimatic ice core site selection. The important effort to provide new geophysical survey in a remotest area of East Antarctica must be supported.

While the main result is of interest this manuscript suffers of some flaws: it is not clear the use of previous radar survey (Soviet, Japan and bedmap2 compilation) in the new map; the grid cell of 500 m is unsustainable and useless with a survey spacing

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from 5 to 10 km and relative interpolation of tens km; the information about internal layering depth and age respect to Dome Fuji ice core are not reported anywhere; the description of subglacial lakes detection is very limited and the thickness of melting/no melting threshold is not reported, and it is a crucial point for GHF; as reported by Fisher et al., 2013 it is very important not only find undisturbed ice of 1.5 Myr but also that the ice between 1.2 and 1.5 myr must be enough thick to detect the 40 kyr cycle, a map of the deepest datable isochrones (from DF) is a crucial point to analyse and report. In detail:

Fig 1 WGS84 is not a map projection, is a geodetic spatial reference system

All figure: add elevation contour line, change West with East, Are data plotted only OIR (fig 2 and 5) or GEA-OIR?

Page 3 Line 29-30 the elevation change is negligible information, remove.

Page 3 Line 29-33 If the Soviet data are not useful due to the position uncertainty why use bedmap2 based on this data? The new grid must be constructed using only the AWI and Japan data, and BEDMAP2 must be used outside the new survey area.

Paragraph 2.2 The paragraph must be clarify and analysed only the cross point of radar profile and not the gridded data.

Page 4 line 8 “parallel” or “perpendicular”?

Page 4 Line 16-19 what is the meaning of “points qualified”? The difference in ice thickness and standard deviation between Soviet and AWI does not appear so large respect to the comparison of GPS position survey of GEA-OIR and AWI-Japan. Please clarify the point and the uncertain in geographic position of Soviet profile.

Figure 2 Add the radar profile, why use only OIR profile, instead OIR e GEA? East instead of West

Figure 3 Elevation contour, yellow line New Thickness is very far from radar profile (25

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km?), is it the gridded area?

Page 9 Line 2 Dome Fuji area is about 1000 km from the coast, and it is not “the most easily accessible region”, but the closer to the Dome Fuji Station.

Fig 6 Add elevation contour line and radar line used, it is not clear (cf Fujita et al., 2012) explain.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2017-258>, 2017.