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TITLE: Ingredients for a value-neutral target data set of exposure-age constraints on ice sheet thickness change (*Invited*)

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ABSTRACT BODY: A primary purpose, of the effort to collect exposure-age constraints on LGM-to-present ice thickness change from all possible ice-free sites in Antarctica, is to provide a data set useful for validating numerical ice sheet models that aim to replicate past ice sheet changes and predict future ones. In this talk, we describe several challenges to using exposure-age data as model validation targets and suggest means of addressing these challenges. First, asking whether or not a cosmogenic-nuclide measurement is consistent with a model ice thickness prediction requires using several assumptions about cosmogenic-nuclide production rates to convert a nuclide abundance measurement to an exposure age. As understanding of production rate systematics is rapidly evolving, data presented as calculated exposure ages alone become rapidly obsolete. This can be addressed by maintaining a data set of raw observations rather than derived ages. Second, by nature most exposure-age data sets are collected in regions of complex topography where ice thickness varies on a spatial scale much smaller than the grid size of typical ice sheet models. Thus, assessing consistency between an exposure-age observation and a model prediction requires assumptions about sub-grid-scale glaciology. We are addressing this issue by using simple flowline models to explore the relationship between regional ice thickness and local ice margin elevations in mountainous areas. Third, many geologic processes act to cause the apparent exposure age of an ice-marginal deposit to differ from the age it was actually emplaced. Thus, a model-data comparison must include some means of assessing whether a model-data misfit is the result of these processes. This issue can be addressed by collecting additional field data that enables us to exclude or correct spurious observations, or by explicitly including a geologic process model as an intermediate step between a predicted ice thickness history and a predicted distribution of exposure ages.

KEYWORDS: [0726] CRYOSPHERE / Ice sheets, [1150] GEOCHRONOLOGY / Cosmogenic-nuclide exposure dating, [9310] GEOGRAPHIC LOCATION / Antarctica.

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