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New δ18Oatm, δ18Oice and δDice profiles from deep ice of the TALDICE core

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The study of the deep portions of ice cores still represents a poorly explored field due to the presence of processes acting in the lowermost layers and possibly affecting the preservation of the original climatic signal. For the 1620 m TALDICE ice core, drilled at Talos Dome (East Antarctica), the high-resolution climate reconstruction and chronology definition are available only until the depth of ~1450 m (150 kyr BP) (Stenni et al., 2011, Bazin et al., 2013). Our aim is to investigate the portion below 1460 m depth to the bottom of the core, where radargrams show the presence of an unconformity in the ice sheet, to define a preliminary chronology and identify a discernible climatic signal.

Here we present the new TALDICE $\delta^{18}O_{atm}$ record in the air bubbles, in association with the new high-resolution $\delta^{18}O_{ice}$ and δD_{ice} profiles and an ^{81}Kr radiometric date. New 46 measurements of $\delta^{18}O_{atm}$ allowed to increase the resolution of the available profile from 1357 to 1553.95 m depth and to extend the record till the bottom of the core at 1617 m depth. The comparison between the $\delta^{18}O_{atm}$ profile of TALDICE and the one of EPICA Dome C (EDC) ice core (Extier et al., 2018) allows to solidly define a preliminary age-depth relationship for the TALDICE core until 1500 m depth, where the gas age is estimated to be ~200 kyr BP. Below 1500 m, supplementary $\delta^{18}O_{atm}$ measurements will be needed to identify older precession cycles and to extend the age-depth relationship further back in time. On the other hand, the high-resolution isotopic profiles in the ice ($^{18}O/^{16}O$ and D/H ratios) obtained below the depth of 1528 m and compared with the EDC ones suggest that the climatic signal in the ice is preserved until to the lower level of 1547.8 m, which is dated back to 343 kyr BP. However, the lack of similarities with the EDC water isotopes record below this depth, in spite of the ^{81} Kr radiometric age 459 ± 50 kyr BP at the depth of 1574-1578 m, indicates the missing of the MIS 11 in the isotopic profiles. Moreover, the increase of high-frequency variability in the $\delta^{18}O_{ice}$ and δD_{ice} below 1547.8 m depth implies that this part of the core lays in an area of the ice sheet characterized by different properties in comparison to the ice above.

Additional $\delta^{18}O_{atm}$, ^{40}Ar, $\delta^{18}O_{ice,}$ and δD_{ice} measurements will be performed in the lowermost

portion of the core and the results will be compared with the new ^{81}Kr radiometric dating at the depth of 1560-1564 m and 1614-1619 m to better constrain the chronology and to investigate the ice properties in the deeper portion of the core.