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New Constraints on Cosmic-Ray Propagation Models using Hydrogen and Helium Isotope Measurements from the BESS-Polar II Experiment NICOLAS PICOT-CLEMENTE, Institute for Physical Science and Technology, University of Maryland, BESS-POLAR COLLABORATION — Deuterium ^2H and Helium 3 ^3He cosmic rays are mainly secondary particles produced by the spallation of Helium 4 nuclei (^4He), or by the fusion of Hydrogen ^1H, after interacting in the interstellar medium during their propagation. As for the well-known Boron-to-Carbon ratio B/C, the secondary-to-primary ratios of $^2H/^1H$, $^2H/^4He$ and $^3He/^4He$ bring essential information to better understand the propagation of cosmic rays in the Galaxy. BESS-Polar II is a balloon-borne experiment that flew over Antarctica during the 23rd solar cycle minimum in December 2007 through January 2008 for 24.5 days. The instrument is a superconducting magnet spectrometer made of multiple particle detectors capable of precisely separating hydrogen and helium isotopes from 0.2 GeV/nucleon to 1.5 GeV/nucleon. The latest isotope measurements from BESS-Polar II, which are the most precise to date, will be presented and compared to other experiments. The GALPROP program will be used to emphasize the new constraints that these results bring on propagation models and parameters.

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