

**Paper No. 9-5 Presentation Time: 8:00 AM-12:00 PM *ISOTOPIC***  
***EVOLUTION OF WATER IN A SIERRA SNOWPACK***

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We analyzed the isotopic composition ( $\delta D$  values) of several profiles of precipitated waters in the Sierra Nevada winter 2001/2002 snowpack over the course of the winter as the snowpack accumulated. Snow pits were dug to the ground and observations regarding snow crystal identification and implications are considered along with vertical temperature profiles, vertical hardness profiles, and vertical isotopic profiles. Measured  $\delta D$  values range from -161‰ to -48‰. Individual snowfall events with greatly negative isotopic values are identified and correlated to specific weather events. At least several major storms are identifiable because of their greatly negative  $\delta D$  values when compared to the bulk of the snowpack. These low  $\delta D$  values persisted throughout the season in nine snow pits within a 7 x 20 m area isolated from skier and snow machine traffic. The results show that although the morphology of crystals in the snowpack changes over the course of the winter isotopic characteristics of the snowpack remain consistent and that we can track these trends throughout the season as the snowpack matures. These highly negative features persist throughout the season and show little to no vertical migration due to vapor transport. The implication is that there are insufficient thermal gradients developed within this Sierra snowpack to foster significant vapor transport of water in the snowpack, and consequent isotopic changes. The homogenization of isotopic values in the snowpack occurs only at the end of the season as the equitemperature snowpack melts and free water begins to flow through the snowpack.

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