40 Years of Snow Physics at the University of Innsbruck, Austria: An Overview of Basic Studies, Development of Instruments and Results

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Starting 1968, basic investigations have been performed of snow electromagnetic parameters - such as dielectric and magnetic functions - and of hydraulic quantities controlling the water flow through a snow cover - such as hydraulic conductivity, permeability and irreducible water saturation. The effect of snow texture and structure properties such as bulk density, porosity, mean grain size and grain size distribution, grain shape, the stage of metamorphism, and last but not least, the liquid water content and its spatial distribution were of special interest. Other topics of special interest were the detection of the geometrical structure of the water component in wet snow, its variation with water saturation and the development of techniques for snow and soil wetness measurements. Differences and similarities between maritime and alpine snow covers have been studied, and long-term measurements have been done to monitor the development of liquid water distribution and the formation of melt water waves in a snow cover. Results of a 40 year research period are reported.