WET SNOW REVISITED

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The problem of measuring liquid water content of wet snow has been closely examined for the purpose of establishing a laboratory reference standard to calibrate field methods. We report the following preliminary findings from this study still in progress:

1. An inexpensive plastic centrifuge adapted from a kitchen appliance is satisfactory for rough determination of free water, but, like previously described centrifuges, fails to remove all the water.

2. Of the various methods reported in the literature, freezing point depression appears to be the simplest. It is applicable both in the laboratory and in the field and may yield useful results over a useful range of liquid water content.

3. A new method, dye dilution, has been introduced. If a dye solution of known concentration at 0° C is thoroughly mixed with wet snow and the resulting decanted fluid compared with the original solution in a spectrophotometer, the amount of liquid water originally present in the snow can be deduced from the observed dilution. This method appears to give reliable and accurate results in the laboratory. Potentially it is very simple for field use when the decantate is collected and returned to the laboratory for the precise spectrophotometry required.

4. D.C. resistivity measurements can detect high levels of liquid water content in snow very readily, but precise determinations are obscured by other factors affecting resistivity. Exploration of these other factors, however, has turned up the useful fact that resistivity is profoundly affected by the kind of metamorphism snow experiences. A resistivity profile of an alpine snow cover clearly distinguishes between layers of ET and TG snow. The possibility thus arises for remote sensing of the metamorphic path followed by various snow cover layers during the course of a winter.