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Reproducing the mechanical behaviour of snow is a challenging task for many d
fields (e.g., Civil and Environmental Engineering, Physics, etc.) and can be
topics, such as: the stability of mountain snowpacks, the safety of structures a
cold environments, the social and physical risk for people and goods in s

The available constitutive models for snow generally use the elasto-plas
reproduce different and complex items of this peculiar material with reference
and on-site conditions. Nevertheless, these models are often related to som
snow (i.e., rounded grains, faceted crystals, etc.) and cannot be used for
Moreover, many models do not consider viscosity, rate-sensitivity, bondin

In this work, we introduce the theoretical bases of our proposal for a new
constitutive model for snow. The model is based on the theory of visco-plastici
applications with an implicit integration scheme, and can reproduce both
quantitatively the findings of some literature experimental data. For instanc
are obtained for the following tests: triaxial compression and relaxation, volu
and creep. Finally, we suggest possible improvements of the model to includ
features not considered so far, such as: the collapse in compression of the we
the change in shape of snow grains, the ductile-to-brittle transition of the