Constitutive models are physical theories which link stresses with the resulting deformation and thus should enable a realistic simulation of material behavior. Constitutive modelling is a core subject in geotechnical engineering, as the quality of every numerical simulation depends on the used model.

Barodesy, a constitutive model for soil, shows similarities to *hypoplasticity* and differs from the mainstream approach of *elasto-plasticity*. It is characterized by its mathematical simplicity and captures many important aspects of soil behavior.

The question '*what information can be stored in soil?*' can be expressed as follows in mathematical terms: '*what are the independent variables in a constitutive model?*' In the present form of barodesy, the memory of soil is stored only in two state variables, stress and void ratio. It is astonishing to note how many effects can be described with such a 'poor' memory. However, in some cases it is not possible to distinguish between monotonic loading and reloading and consequently it is not possible to describe cyclic loading paths.

The *aim of this proposal* is to extend barodesy to capture reloading. In soil mechanics it is known that changing the direction of loading will lead to a temporary increase of stiffness compared to monotonic loading. The direction of deformation is described by the so-called *stretching tensor*. Thus, a change of stretching should yield a temporary increase of stiffness.

The *underlying hypothesis* is that constitutive models, and in this case barodesy, can be designed on the basis of so-called tensorial relations. It is expected to establish a relation that will provide a *new and simple way to model (in terms of mathematics) irreversible mechanical behavior*. The already introduced barodesy is a convincing new paradigm, and this proposal aims at closing a gap in this respect.

The extended barodetic equation will be compared with experimental data as well as with other constitutive models. It is expected to achieve scientific progress in the field of constitutive modelling.