Introduction

Since 1989 the ALERT network (alert.epfl.eh) joins European research groups active in the field of geomaterial (soil, rock and concrete) modelling and characterization. Its current membership includes 27 universities and research institutions, amongst them Università di Padova, Politecnico di Milano and Politecnico di Torino. One of the main activities of Alert is the regular organisation of a three-day workshop in Aussois (France), where new research in the area is exposed and debated. The 19th edition of such workshop was held between the 6th and 8th of October 2008 and included one session dedicated to "Field and laboratory testing", which we organised.

The title of the session was left deliberately vague so as to encourage a wide array of submissions, with the single requisite of containing some novelty in the area of measuring geomaterial behaviour either in the laboratory or in the field. The response was excellent and we were hard pressed to select 12 abstracts for presentation amongst the 29 that were submitted. The session was also enriched with invited lectures from Chris Clayton (University of Southampton, UK) and Alain Puech (Fugro offshore, France). The good reception of the different presentations and the lively debate that they encouraged were behind the invitation by Roberto Nova, then RIG editor, to develop some of the contributions to that session into this special issue.

Again, it was very difficult to decide which presentations were more suitable to become articles, with the necessary requisites of novelty and interest for a wider audience. Six were initially selected and their authors agreed to contribute to the special issue. Unfortunately, two of them did not manage to abide with the tight deadlines required for the peer-reviewed publication process. The papers that were finally contributed include two from Italian groups [Comina C., Cosentini R.M., Foti S., Musso G.] [Mitaritonna G., Amorosi A., Cotecchia F.] and two from other European neighbours [Brückl J., Wang X.T., Wu W.] and [Ghabezloo S., Sulem J.]. Three papers out of four deal with different laboratory techniques [Mitaritonna *et al.*; Comina *et al.;* Ghabezloo and Sulem] whereas focus is on the interpretation of field tests. There is also variety in the geomaterials considered, including concrete [Brückl et *al.*], rock (sandstone in Ghabezloo and Sulem), and soil (sand by Comina *et al.;* clay by Mitaritonna *et al.).*

Despite that variety, several common trends can be discerned in the papers. It is clear, for instance, that the use of non-destructive tools as a means to monitor mechanical changes in geomaterials is now a very powerful trend. Three of the papers [Mitaritonna *et al.;* Comina *et al.;* Brückl *et al.*] measure elastic waves travelling through either samples or structural elements; Comina *et al.* go further and also employ electromagnetic waves. It is also clear that there is a strong research effort directed at understanding non-mechanical influences in the mechanical response of geomaterials; thus Ghabezloo and Sulem look at pressurization induced by thermal loading in rocks, Brückl *et al.* consider concrete aging, which is a chemically induced mechanical change and Comina *et al.* apply their methods to track non-mechanical variables (saturation degree or salt concentration) that might have profound mechanical consequences. Finally, it is clear that all the papers have the hallmarks of top-quality experimentation: careful consideration of the background theories, minute attention to detail and clear reporting of results. We hope that all RIG readers will quickly find something for themselves in these excellent articles.

We want to acknowledge here the great effort made by all authors to provide high-quality and timely contributions, by the external reviewers to offer in-depth examinations of the initial manuscripts sent by the authors and by the editorial staff at RIG in the edition and organisation of this issue. Finally we want to stress how honoured we were by the invitation received from Roberto Nova to edit this issue. We are firmly convinced that we will soon work with him again in other attractive challenges like this one.

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