Cement is the more used building material constituent, and will continue to be largely used in the years to come. Its production generates CO₂ emissions.

It is, thus, of primary importance to optimize the use of this cement in the concrete structures, while checking that these structures have lifespan compatible with the stakes of the sustainable development. To take up this challenge, it is essential to use adapted tools of quantification making it possible to justify, in a rigorous and reliable way, the strategic and technical choices adopted.

The numerical methods (finite elements, finite volumes, finite differences ...) constitute a relevant response to this challenge. They potentially allow, due to a best taken into account of the rheological, physico-chemical, and mechanical concrete properties, and of thermo-hydro-mechanics and environmental boundary conditions on the structures, to optimize these structures (optimization with respect to time, money, safety, energy, CO₂ emissions, and, more generally, life cycle), in a way more reliable than the codes and analytical approaches currently used.

The control of the concretes placing in the formworks, their durability, their cracking, their shrinkages, and their creeps, with respect to the sustainable development (evaluation of CO₂ emissions, for example) constitute, therefore, the principal topics of this international conference.

The objective is to join together researchers, engineers, architects, urbanists, industrials and owners, to exchange and reflect on the use of these numerical tools and their contribution with respect to the current stakes of sustainable development.

**Conference Topics**

**I. Theoretical and Numerical Models**

I.1. Flowing and Casting
I.2. Early age behaviours
I.3. Drying, Shrinkages and Creeps
I.4. Cracking behaviours (static, fatigue, dynamic)
I.5. Chemical aging (chemical reactions and transfers)
I.6. Coupling Problems

**II. Structural applications and Sustainability**

II.1. Bridges
II.2. Buildings
II.3. Nuclear structures and storages
II.4. Tunnels
II.5. Roads and Railways
II.6. Others applications
**Accommodation**

A large list of hotels is available on the website of the Tourism Office of Aix on: [www.aixenprovencetourism.com](http://www.aixenprovencetourism.com)

**Reservation Center:**
Tel. +33(0) 4 42 16 11 84 or 85
mailto:resaix@aixenprovencetourism.com

You must make your own reservation. You can benefit of a special discount if you specify that you attend the conference at the Congress Center.

**Scientific Exhibition**

A Scientific Exhibition will be held in the Congress Center. This is an opportunity for companies to present their works. Costs of booking are available on the website.

**Technical Visit and Banquet**

The Technical Visit will take place at the « Baux-de-Provence » on June 1st, 2012 afternoon. A banquet in a famous castle will follow the visit.

**Conference Secretariat**

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