



## **PSI and DINSAR interferometry useful tools for monitoring earth movement: The Grand-Palais-Invalides case example (Paris - France)**

B. Deffontaines (1), S. Magalhaes (2), B. Fruneau (2), R. Cojean (3), E. Ledoux (3), M. Salim (3), M. Deveughele (3), P. Goblet (3), P. Zokimila (3), A.M. Prunier-Leparmentier (4), and the Altamira Information, c/ Còrsega, 381-387, 2n 3a - E-08037 Barcelona, Spain Team

(1) Labo ISTE, Université Pierre et Marie Curie - Paris 6, 4 place Jussieu, 75252 PARIS Cedex 05, France (benoit.deffontaines@upmc.fr), (2) Université Paris-Est Marne-la-Vallée, laboratoire G2I, 5 boulevard Descartes, 77454 Marne-la-Vallée, Cedex 2, (3) Centre de Géosciences, Ecole Nationale Supérieure des Mines de Paris, Mines ParisTech, 33, Rue Saint Honoré, 77305 Fontainebleau cedex, France, (4) Inspection Générale des Carrières, 3, Avenue du colonel Rol-Tanguy, Place Denfert-Rochereau, 75014 Paris, France.5

A multidisciplinary approach funded by ANR Hydrogeobat 2005, takes into account radar DINSAR and PSI interferometry, geological field works, geomechanical, and hydrogeological analyses of the Seine river, was developed in Central Paris Grand-Palais-Invalides in order to reveal and better understand surface displacements of that area through time.

More than 400 ascending and descending Radar ERS1 and 2 and ENVISAT images were acquired and processed in order to decipher small displacements of the topography in the Grand-Palais - Invalides area from 1992 to present. One may note the long not linear subsidence that affects and deformed buildings on both side of the Seine river bank. As the surface displacements are only plurimillimetric per year in magnitude, they seem highly related to the variation of the Seine river level. Numerous hypotheses prevail including variation of bedrock granulometry of the local alluvial plain deposits, as well as wooden geotechnical foundations on the muddy and silty flood plain deposits, or major man underground works. Anyway, it clearly appears the great complementarity of these approaches in order to solve such complex geological problems.