



Department of Civil Engineering and Engineering Mechanics  
Columbia University

**Tuesday, October 4, 2011 (2:30-3:30 pm)**  
**CEPSR 414**

## ***Retrofitting Insufficient Splice-Lengths by Means of FRP-Confinement***



**Prof. T.P. Tassios**  
*National Technical University of Athens*  
*Greece*

(Host: Prof. George Deodatis)

FRP confinement has been shown to successfully reinstate full bond capacity of insufficient splice lengths and allow for yielding of steel to take place. To design such structural interventions, the lecture will present a rational model consistent with first principles. The traction crack appearing along the spliced bars, reduces the available tensile strength of concrete (in Fracture Mechanics terms), gradually diminishing residual bond resistance. Simultaneously, shear slip along the crack, results in lateral dilatancy (crack “opening”); thanks to it, the surrounding confining sheet is tensioned, a diagonal compression force acts on the cracked interface and a friction resistance is generated, contributing to an apparent bond resistance (for inter-bar slips as small as 0,3 mm). The theory ends up with a closed formula for design, and some interesting comparisons with empirical formulae available in literature.

### **Biosketch**

Prof. Tassios is an expert in Soil Mechanics, Testing Materials and Reinforced Concrete. He devoted decades of personal work and of his excellent co-workers to a scientifically based analysis and modeling of the complex behaviour of various associations of concrete and steel. He is the author of about 400 papers and books in several languages and co-organiser of more than 30 international conferences. He was also invited keynote speaker at a number of conferences. A member of the Academy of Sciences of Torino, Italy, doctor honoris causa of Liege University, Belgium, of S.E. University of Nanjing, China, and of Democritos University, Greece, he has also served as an expert and consultant of United Nations Organization and of the European Union, as well as President of international scientific organizations. He is honorary President of the Hellenic Society of Philosophy, and President of the Society for the Study of Ancient Greek Technology. His past occupation also involves the positions of: UNESCO and UNIDO Expert for Earthquake Mitigation and the Building Industry in the 3rd World. He was president of CEB and FIP, giving the highest contribution to the perfection of the Codes of Practice. He made high achievements in transforming the previous European Recommendations and Models for Concrete Structures into a complete Model Code intended to be the basis for the Eurocodes.

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