

# Materials Science and Engineering

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## Analysis in large deformation of a rigid plastic prestressed beam in ultra-high performance fiber-reinforced concrete

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One of the major concerns in designing of prestressed beams in ultra-high performance fiber-reinforced concrete (UHPFRC) is improvement of their ductility fracture due to the nature of the materials used in their manufacture. This can induce plastic behaviours which it is necessary to take into account by designing of such structures, especially when they are of large spans. In the present work, it is proposed an analytical model in large deformation of a rigid plastic prestressed UHPFRC beam embedded at one end and having at other end rolled support. She is approached by a local uniform load and external moments to supports. The proposed non-linear model can find exact analytical solutions for the determination of the local arrows and the associated charge by the technique of Lagrange multiplier which allows finding the stationary points of differentiable

function of one or several variables under constraints. The results of this work can be useful in designing and calculation of long span prestressed structures with plastic rigid behavior.

### Speaker Biography

Abelime Passoli is a PhD student in Engineering Sciences (DOCs3s4-SPI) at the University of Abomey-Calavi, Cotonou, Benin. He is a graduate of the National Conservatory of Arts and Crafts (Cnam) of Paris in France and of Higher National School of Technology (ENSUT) in Dakar, Senegal. As a Construction and Planning Engineer, he has held several senior positions in the public and private sector with more than 26 years of experience in the field of transport and public works and the management of various phases of road infrastructure, urban infrastructure, rural equipment project studies and public contracts. As a Specialist in transport economics, since 2004 he has been involved in the technical and economic studies of infrastructure projects in Togo and in the sub-region through the SITRASS network in the expertise and valuation of companies' real estate assets.

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