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Experimental investigation of moment-rotation curves of end-plate connection using sinusoidal beam

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A structural engineer aims to optimize dimensions of the buildings in order to obtain the frames have high moment resistance with reduced weight. The pre-stressed composite girders or high-strength steel can be used for this purpose. Another way to provide the optimum solution is to make some changes in the shape of beams. Beam-to-column connections play an important role in behavior of steel frames. To model the behavior of connections, the moment-rotation curve must be used. Full-scale experiment is carried out to obtain real moment-rotation characteristics of connections. The rotation and moment are determined by using displacements of the beam connections in the experiments. The designed connections form moment-rotation curves according to the elements of connection and the shape of placement. That is, the moment and rotation is dependent on the geometric parameters of the elements used in the connection. A new beam model called sinusoidal beam is suggested in this study. Various experiments were carried out for four beam models; two sinus beams, one simple model and one IPE beam model. Results are compared with experiments performed with IPE profiles. It was aimed to investigate the effect of the sinus degrees in the web I beam on their moment-rotation curve. The presentation exhibit the moment-rotation curves of fixed end-plate connection made from sinusoidal beams and evaluation of the structural performance of sinusoidal beams.

Biography

Merve Sagiroglu is an Assistant Professor at Erzurum Technical University, Turkey. She received her PhD in Civil Engineering in 2013, from Atatürk University in Turkey. She completed Post-doctoral studies in Penn State University, USA in July, 2015. Her research interests include structural behavior of steel connections, modular buildings and structural analysis.

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