



## A Novel Method for Linear Analysis of Partially-Composite Beams

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### Abstract

*Recently, the analysis of composite beams with partial-interaction between concrete slab and steel beam has become of interest. Due to flexibility of available shear connectors in practice, considering full-interaction between the concrete slab and the steel beam cannot be perfectly true. Moreover, full-interaction requires a significant number of shear connectors in a beam, which does not seem to be economical and even reasonable because shear connectors should be installed wherever they are needed the most i.e. in regions with large positive flexural moments. On the other hand, there is little benefit in installing shear connectors in regions with negative flexural moments as the concrete slab is in tension. In this paper, initially, the most practical analytical methods to analyze composite beams with partial-interaction is reviewed. Then, a novel method is presented based on previous studies with some modifications. Furthermore, the results of this method are validated with large-scale beam test data. The results of this research suggest that the proposed method can properly determine the slip and stress demands in the shear connectors.*

### Keywords:

*Composite, Bridge, Partial, Retrofit, Rehabilitation*

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