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### Stress concentration due to shear lag in box girder

Existing research on shear lag gives a variety of stress concentration factors. Unlike the elementary beam theory, the application of load is not unique in reality. For example, a so-called concentrated load can be applied as a point load or a distributed load along the height of the web. No existing research works deal with this difference explicitly. This may be a reason for the discrepancy of the stress concentration factors in the existing studies. Although many researchers employed the finite element method and it is known that the finite element mesh must be constructed with great care to evaluate stress concentration, very few researches have taken into account the influence of the finite element mesh on the shear lag phenomenon. The present study investigates the stress concentration in a flange due to the shear lag in a box girder by the three-dimensional finite element method using shell elements. Extensive parametric study with respect to the geometry of a box girder is carried out. The effect of the way load is applied and the dependency of finite element mesh on the shear lag are carefully treated. Based on the numerical results thus obtained, empirical formulas are proposed to compute stress concentration factors due to the shear lag. Moreover, most of the researches on the shear lag have focused on simply supported girders and cantilever girders. The present study is therefore extended to the investigation of the shear lag effect on a continuous box girder.

### Biography

Eiki Yamaguchi has completed his PhD from Purdue University, USA. He is currently Head and Professor, Department of Civil Engineering, Kyushu Institute of Technology, Japan. He has published more than 100 papers and serves as an Editorial Board Member of *Journal of Constructional Steel Research* and a Chief-Editor of *Journal of Civil Engineering*, and *Japan Society of Civil Engineers*.

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