# An SBFEM element for thin-walled beams

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**Key Words:** *SBFEM, thin-walled beams, semi-analytical, Reissner-Mindlin theory*

The scaled boundary finite element method (SBFEM) is a semi-analytical method in which only the boundary is discretized. The results on the boundary are scaled into the domain with respect to a scaling center which must be "visible" from the whole boundary. For beam-like problems the scaling center can be selected at infinity and only the cross-section is discretized.

A new element for thin-walled beams has been developed on the basis of the Reissner-Mindlin plate theory. The beam sections are considered to be multilayered laminate plates with arbitrary layup. The cross-section is discretized with beam elements of Timoshenko type. This leads to a system of differential equations of a gyroscopic type, for which the solution is known.

The element has been tested and compared with an finite element model and it gives good results.

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