SIMPLIFIED STIFFNESS MATRIX FOR CURVED TRIANGULAR ELEMENTS

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Abstract. In this work we present a methodology to compute the stiffness matrix of a curved triangular finite elements using analytical integration instead of numerical integration. A transformation of coordinates is used to refer all the integrations to a reference triangular configuration of straight sides. The curvature of the boundary is modeled using the same shape functions of the element in an isoparametric fashion, although this is not strictly necessary to apply the methodology shown and other geometric definitions of the boundary can be used.