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Effective Method of Paneling for Source/Vortex/Doublet Panel Methods Using Conformal Mapping

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Abstract : This paper presents an effective method to divide panels for mesh-less methods of source, vortex and doublet panel methods. In this research study the physical domain of air-foils were transformed into computational domain of a circle using conformal mapping technique of Joukowsky transformation. Then the circle is divided into panels of equal length and the co-ordinates were remapped into physical domain of the air-foil. With this method the leading edge and the trailing edge of the air-foil is panelled with a high density of panels and the rest of the body is panelled with low density of panels. The high density of panels in the leading edge and the trailing edge will increase the accuracy of the solutions obtained from panel methods where the fluid flow at the leading and trailing edges are complex.

Keywords : conformal mapping, Joukowsky transformation, physical domain, computational domain
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