A new interpolating complex variable meshless method for the bending

problem of Kirchhoff plates

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Abstract

In this paper, on the basis of complex variable moving least squares approximations, a new interpolating complex variable moving least squares (New ICVMLS) method is proposed. In this method, a complete basis function and singular weighted function are introduced to form the new basis function through orthogonalization process. Then a new interpolating shape function is derived, which satisfy the property of Kronecker function.

Combining the New ICVMLS method with the integral weak form of the bending problem of Kirchhoff plates, a new interpolating complex variable element free Galerkin (New ICVEFG) method for Kirchhoff plates is presented. Due to the fact that the essential boundary conditions can be applied directly, the final discrete matrix equation is more concise than that in the non-interpolating complex variable element free Galerkin method.

Finally, several numerical examples are presented to illustrate the advantages of this new interpolating meshless method. Compared with the improved complex variable element free Galerkin (ICVMLS) method, the New ICVMLS method has higher accuracy and efficiency.

Keywords: Complete basis function, interpolating meshless method, Kirchhoff plates