

NUMERICAL METHODS FOR SOLVING A CLASS OF HYBRID WEAKLY SINGULAR INTEGRO-DIFFERENTIAL EQUATIONS

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This paper proposes numerical methods for solving hybrid weakly singular integro-differential equations of the second kind. The terms in these equations are in the following order: derivative term of a state, integro-differential term of a state with a weakly singular kernel, a state, integral term of a state with a smooth kernel, and force. The original class of weakly singular integro-differential equations of the first kind is derived from aeroelasticity mathematical models [1]. Among the proposed methods, the method for solving linear cases is fully based on a previously reported approximation scheme for equations of the first kind [2]. For nonlinear cases, a revised method is proposed. Examples are presented to demonstrate the effectiveness of the proposed methods, and the results indicate that the proposed methods facilitate achieving satisfactory and accurate approximations.

REFERENCES

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