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A second order accurate jump condition capturing scheme for sharp interfaces on Cartesian Grids ZHIPENG QIN, AMIR RIAZ, Univ of Maryland-College Park, ELIAS BALARAS, Goerge Washington University — A robust second order accurate method is presented to solve the Poisson's equation with discontinuous coefficients on uniform Cartesian grid. Volume fraction weighted average of discontinuous variables is used to implement the jump conditions. This method preserves the jump in the function and its derivatives across the interface by adding correction terms to enforce second order formal accuracy. The new method is implemented using a standard finite different discretization on a Cartesian grid leading to a robust implementation in three spatial dimensions. The coefficient matrix of the linear system is symmetric. The new method is useful for obtaining accurate pressure solutions for two-phase incompressible flow.

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