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Existence of a solution to an equation arising from Mean Field Game

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We construct solutions to a non-local Hamilton-Jacobi, so-called Master Equation in Mean Field Game, starting from value functions which are metric viscosity solutions to Hamilton- Jacobi equations. The metric viscosity solutions have a representation formula from which solutions to the so-called First Order Mean Field equation can be derived. For the sake of illustration, the current study has been restricted to a special class Lagrangian. (This talk is based on a joint work with A. Święch).