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HJB equations on the process space, application to mean field control with common noise

Motivated by the problem of mean field control with common noise, we consider a general class of partial differential equations on the space of square integrable processes, which appear naturally as the dynamic programming equation for a corresponding class of control problems. By introducing a suitable notion of viscosity solutions, we provide a comparison result between Lipschitz sub and supersolutions. The existence is obtained by a representation result which is standard for such dynamic programming equations.