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Andrea Cosso and **Fausto Gozzi*** (fgozzi@luiss.it), viale Romania 32, 00197 Roma, RM, Italy, and **Idris Kharroubi**, **Huyen Pham** and **Mauro Rosestolato**. *Optimal control of path-dependent McKean-Vlasov SDEs in infinite dimension*. Preliminary report.

We study the optimal control of path-dependent McKean-Vlasov equations valued in Hilbert spaces motivated by non Markovian mean-field models driven by stochastic PDEs. We first establish the well-posedness of the state equation, and then we prove the dynamic programming principle (DPP) in such a general framework. The crucial law invariance property of the value function V is rigorously obtained, which means that V can be viewed as a function on the Wasserstein space of probability measures on the set of continuous functions valued in Hilbert space. We then define a notion of pathwise measure derivative, which extends the Wasserstein derivative due to P.L.Lions (2006), and prove a related functional Itô formula in the spirit of Dupire (2009) and Wu-Zhang (2020). The Master Bellman equation is derived from the DPP by means of a suitable notion of viscosity solution. We provide different formulations and simplifications of such a Bellman equation notably in the special case when there is no dependence on the law of the control. (Received January 05, 2021)