Regularity of Monge-Brenier Potentials and Monge-Ampére Equation on Wiener Space

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We discuss the Sobolev regularity of Monge potentials under the assumption that the initial measure is log-concave and the target measure has strictly positive density on an abstract Wiener space. We prove that the backward Monge potential is an element of the second-order Sobolev space. This regularity result allows us to show that the backward Monge potential solves the Monge-Ampére equation. We also prove that forward potential solves the Monge-Ampére equation in Alexandrov sense under a weaker assumption than log-concavity. (Supported by Tubitak Project No. 118F403.)