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A construction of the Schrodinger Functional for Möbius Domain Wall Fermions

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We investigate the universality of Möbius Domain Wall Fermions (MDWF) in the Schrödinger Functional (SF) scheme at tree level. We introduce the SF boundary condition to the MDWFs by adding a temporal boundary operator. When the fifth dimensional parameters of the MDWF are a constant, this construction seems to be natural according to the Luescher's universality prescription for the overlap fermion and Takeda's construction for the standard domain wall fermion (DWF). We observe that the four dimensional effective operator derived from this DWF approaches to the continuum operator with the SF boundary condition at tree level. In order to construct the SF boundary condition for the Optimal DWFs, the fifth dimensional parameters so as to maintain both the discrete symmetries and the chiral symmetry breaking property of the SF boundary term. This additional symmetry makes the MDWF with the SF boundary condition impossible to introduce Zolotarev optimal coefficients. We will discuss how to realize the optimal type of the MDWF with the SF boundary condition.

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