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Progress on the infinite volume based gradient flow for high precision determination of the $\Lambda_{\bar{M}S}$ scale of QCD.

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We recently introduced and tested the application of the infinite volume based gradient flow for the scale dependent renormalization of the strong coupling. Recent developments of this alternative approach are reported for the high precision determination of the beta-function and the physical scale of the $\Lambda_{\bar{M}S}$ parameter in QCD with three massless flavors and its Yang-Mills limit.

Authors: WONG, Chik Him (University of Wuppertal); KUTI, Julius (U.C. San Diego); BORSANYI, Szabolcs (University of Wuppertal); FODOR, Zoltan (University of Wuppertal, Penn State University, Eotvos University, IAS Jülich, UC San Diego)

Presenter: WONG, Chik Him (University of Wuppertal)

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