G-adapted deformations and Ekedahl-Oort stratification of Shimura varieties

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Ekedahl-Oort stratification was firstly defined and studied by Oort for the moduli space $\mathcal{A}_{g,\mathbb{F}_p}$ of principally polarized abelian varieties over $\mathbb{F}_p$. This notion has been generalized and studied by Moonen, Wedhorn, Viehmann and Zhang for good reduction of general Shimura varieties of Hodge type. Let W be the reductive group G of a mod p Shimura variety S. Then the Ekedahl-Oort strata of S are parametrized by a certain subset ${}^JW$ of W. In one of the recent works of Viehmann, it is showed that ${}^JW$ corresponds naturally to some objects coming from the loop group $\mathcal{L}G$ of G. But this correspondence is purely group theoretic and hence one naturally asks the question: is it possible to give a direct connection between S and $\mathcal{L}G$ (the latter is an important object from both the geometric and the arithmetic points of views)? In this talk I will explain that this connection is indeed possible. To give the connection we use the classification result of p-divisible groups in term of Breuil-Kisin modules (equivalently Breuil-Kisin windows) and G-adapted deformations (a notion we borrow from Kisin).