MODULI OF p-DIVISIBLE GROUPS

Goal: Chap 1, 2 and part of 3 of [RZ]. Here is a link to the book.

(1) p-divisible groups and crystals: Chap 1 (Grothendieck-Messing Deformation Theory) of Haoran Wang's master thesis *Moduli Spaces of p-divisible Groups and Period Morphisms*.

More references with details on the foundational materials on p-divisible groups and crystals:

- L. Fargues, An introduction to Lubin-Tate spaces and p-divisible groups, Course notes.
- J. Tate, p-divisible groups. In Proc. conference on local fields (T. Springer, ed.), Springer-Verlag, 1967, 158-183.
- A. Grothendieck, Groupes de Barsotti-Tate et cristaux, Actes du Congr'es International des Math ematiciens (Nice, 1970), Tome 1, pp. 431-436, Gauthier-Villars, Paris, 1971.
- A. Grothendieck, Groupes de Barsotti-Tate et cristaux de Dieudonne e, S eminaire de Math ematiques Sup erieures 45, Presses de lIniversit e de Montr eal, Montr eal 1974.
- Chap. I in: W. Messing, The Crystals Associated to Barsotti-Tate Groups: with Applications to Abelian Schemes, LNM 264.

(2) Semi-linear algebra, B(G), Admissibility: Chap 1 (§1.1-1.18) and Example 1.38–1.54 of [RZ]; or [RV, §2].

(3) Quasi-isogeny of p-divisible groups:§2.1-2.12 Chap 2 of [RZ]

(4) Formulation of moduli functors of quasi-isogenies, representability: the remaining Chap 2 of [RZ]

(5) Formulation of RZ data ([RZ, §3.1-3.25] considers very general EL/PEL cases, it is better for us to consider the simplified version, see section 4 of [RV])

(6) Local model ([RZ, §3.26-3.35])

(7) Examples ([RZ, part of remaining §3])

(8) If the time permits: p-adic Shtukas (part of Scholze's Berkeley lectures and the paper of Pappas–Rapoport in 2021).

Other references can be found at Stage: Fall 2019 topic: Formal groups and p-divisible groups.

References

[RV] M. Rapoport, E. Viehmann, *Towards a theory of local Shimura varieties.* Münster J. Math. 7 (2014), no. 1, 273–326.

[RZ] M. Rapoport and Th. Zink, *Period spaces for p-divisible groups*, Annals of Mathematics Studies, vol. 141, Princeton University Press, Princeton, NJ, 1996. 1

[VW] I. Vollaard and T. Wedhorn, *The supersingular locus of the Shimura variety for* $\mathrm{GU}(1, n-1)$ *II*, Invent. Math. **184** (2011), no. 3, 591–627.

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