



# SEMINARIO DE ÁLGEBRA

## Restricted nil Lie algebras of oscillating intermediary growth

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### Abstract.

The Grigorchuk group [1] is a natural example of a self-similar finitely generated periodic group of intermediate growth. Groups of oscillating (intermediary) growth were constructed by Kassabov and Pak [4].

The author constructed an analogue of the Grigorchuk and Gupta-Sidki groups in case of restricted Lie algebras of characteristic 2 [2], Shestakov and Zelmanov extended this construction to an arbitrary positive characteristic [3]. We also have a continuum family of 2-generated restricted Lie algebras with a nil  $p$ -mapping having Gelfand-Kirillov dimension one but which growth is not linear [5].

All examples of nil restricted Lie algebras constructed before are of polynomial growth. Now, we construct a family of nil restricted Lie algebras with oscillating intermediary growth over an arbitrary positive characteristic.

### References

- [1] Grigorchuk, R.I., On the Burnside problem for periodic groups., *Funktsional. Anal. i Prilozhen.* **14** (1980), no. 1, 53–54.
- [2] Petrogradsky V.M., Examples of self-iterating Lie algebras, *J. Algebra*, **302** (2006), no. 2, 881–886.
- [3] Shestakov I.P. and Zelmanov E., Some examples of nil Lie algebras. *J. Eur. Math. Soc. (JEMS)* **10** (2008), no. 2, 391–398.
- [4] Kassabov M., Pak, I., Groups of oscillating intermediate growth. *Ann. Math.* (2) **177**, (2013) No. 3, 1113–1145.
- [5] Petrogradsky V., Nil Lie  $p$ -algebras of slow growth, *Comm. Algebra.* **45**, (2017), no. 7, 2912–2941.