

Naturalness of the standard model and Higgs boson

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Outline:

- **Running masses in the standard model (SM)**
- **Higgs boson mass evolution and naturalness problem**
- **the standard model: naturalness, hierarchy & fine-tuning and new physics**
- **Summary**

**In collaboration with G. Pivovarov (INR RAS, Moscow)
M. Gouzevitch (Lyon Univ.) et al.**

Probing Higgs boson self-coupling and mass at large momenta

Maxime Gouzevitch's talk on HL-LHC potential for

Summary

- **Standard Model without quadratic evolution for Higgs boson mass requires (!) New Physics to have Naturalness**
- **Naturalness domain of Standard Model with quadratic evolution for Higgs boson mass may be larger than generally accepted: up $\sim O(10 \text{ TeV})$ instead of $\sim O(1 \text{ TeV})$**
- **Present LHC physics: new physics is unavoidable either as a new dynamics of SM or/and a New Physics. Besides search direct search of New Physics it requires 'non-naturalness' studies (talk by M. Gouzevitch)**