The ANR NOUGAT aims at developing and testing a 10 T High Temperature Superconducting insert working inside a 20 T background field. The insert is designed as a stack of pancakes wound with REBCO tapes. Although Metallic Insulated winding has been chosen mostly for its self-protection ability, electrical Insulated coils are still studied as they are required for some applications and show some advantages for user magnets. However, transition detection and protection remain challenging. A model has been developed to better understand the quench propagation inside a winding. One fully instrumented single pancake coil has been studied under high field up to 19 T to provide data to allow comparisons between model and experiments.

1D- Model for fault current limiter, self-field

**Origins of the model:** Fault current limiter model
- Take into account the inhomogeneity along the length of the conductor;
- Does not calculate the field generated by the coil;
- No background field.

**Objectives:**
- Comparison of the model with the experimental study under high field of a fully-instrumented single pancake.

**Main results:**
- Temperature when voltage threshold is reached

**Difficulties:**
- Definition of the heating initialization to match the experiments.

**Comparison to experimental study**

**Objectives:**
- Comparison of the model with the experimental study under high field of a fully-instrumented single pancake.

**Main results:**
- Temperature when voltage threshold is reached

**Conclusion and further work**

**Next objectives of the model:**
- Simulate the whole coil behavior under high field to anticipate the location transition and the way it propagates inside the winding.
- Match the previous study of a single pancake fully instrumented.

**Difficulties:**
- Definition of the heating initialization to match the experimental study.

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