

# Electromechanical analysis of simplified CORC® cable configurations: experiments and FE modeling

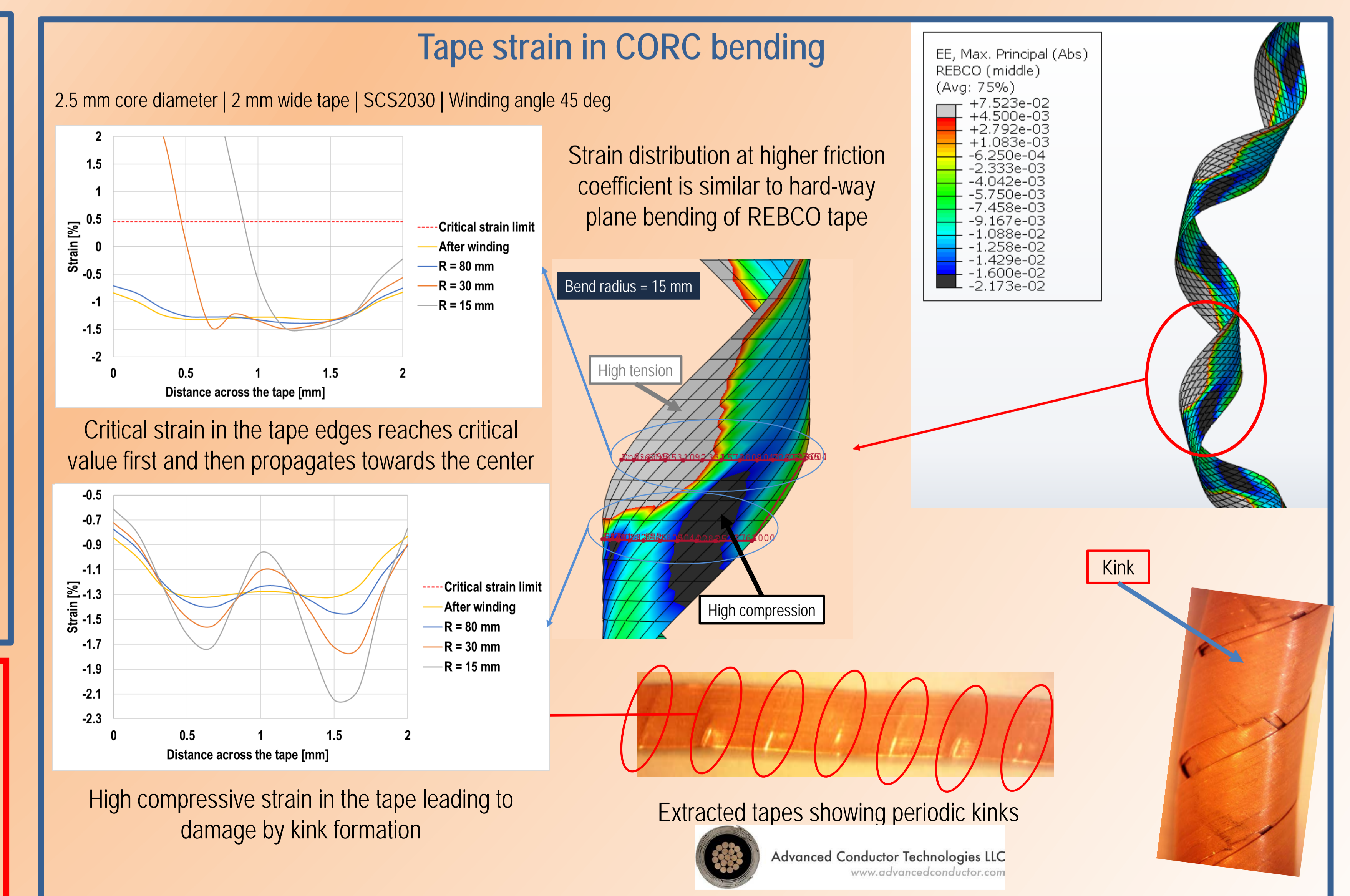
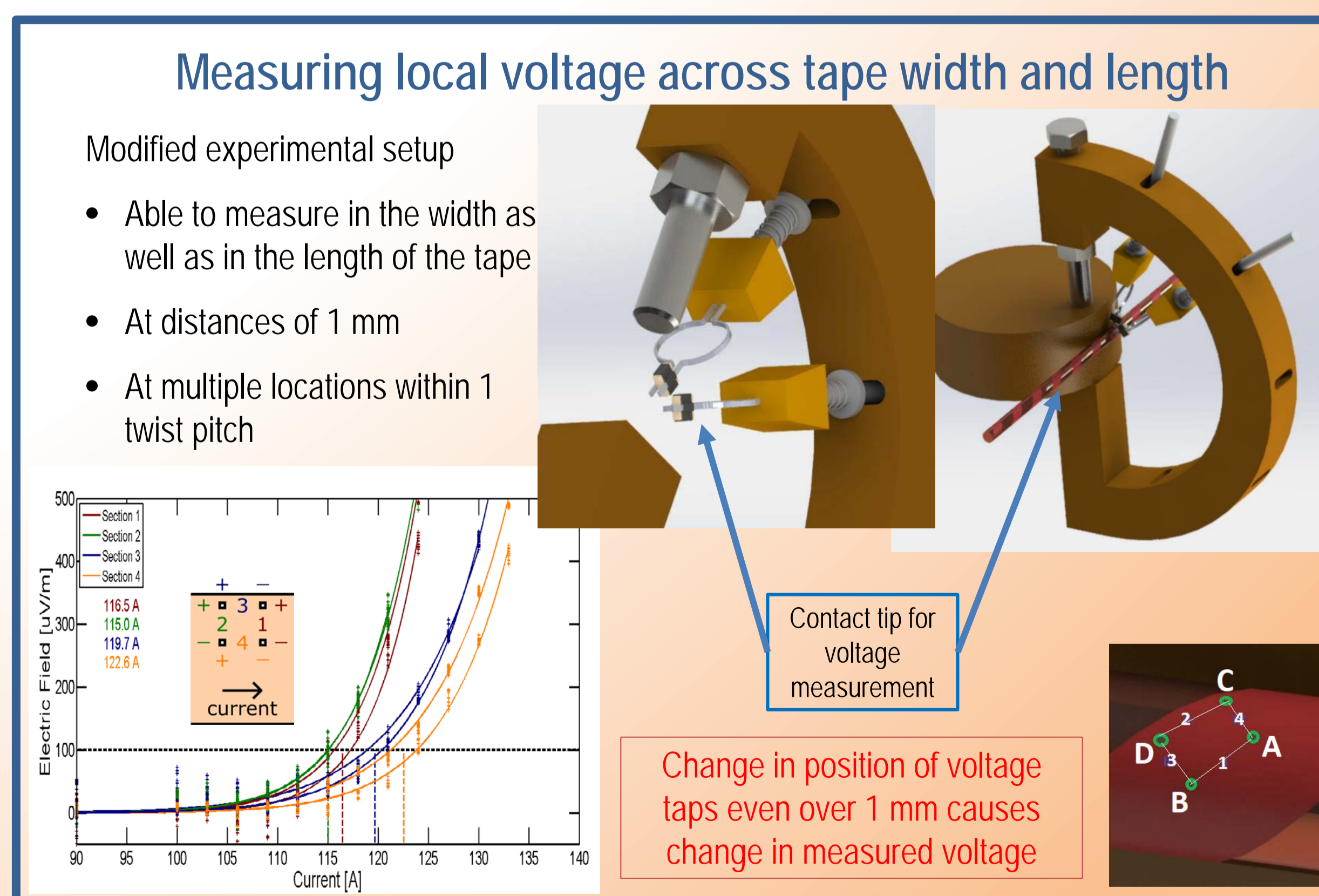
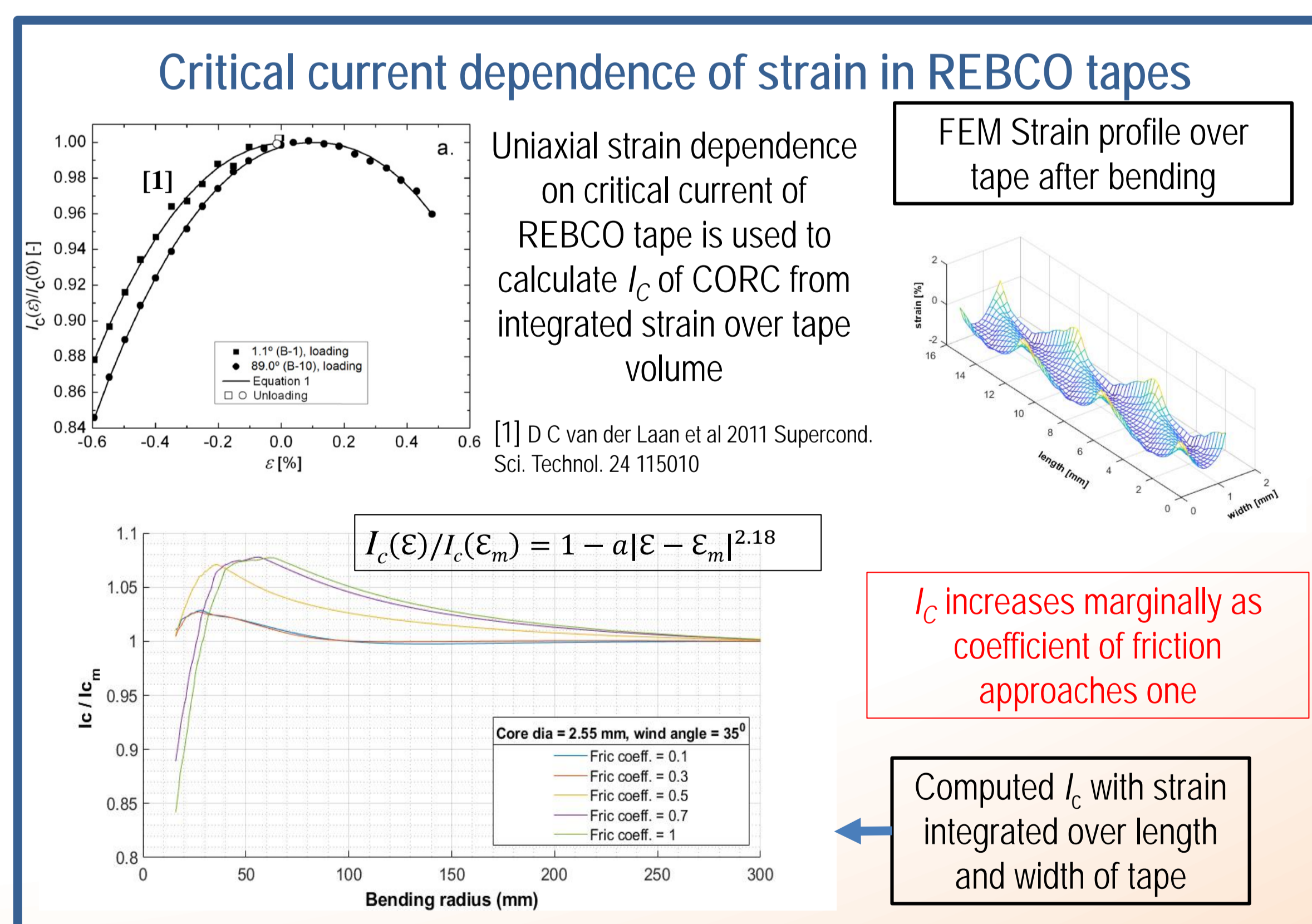
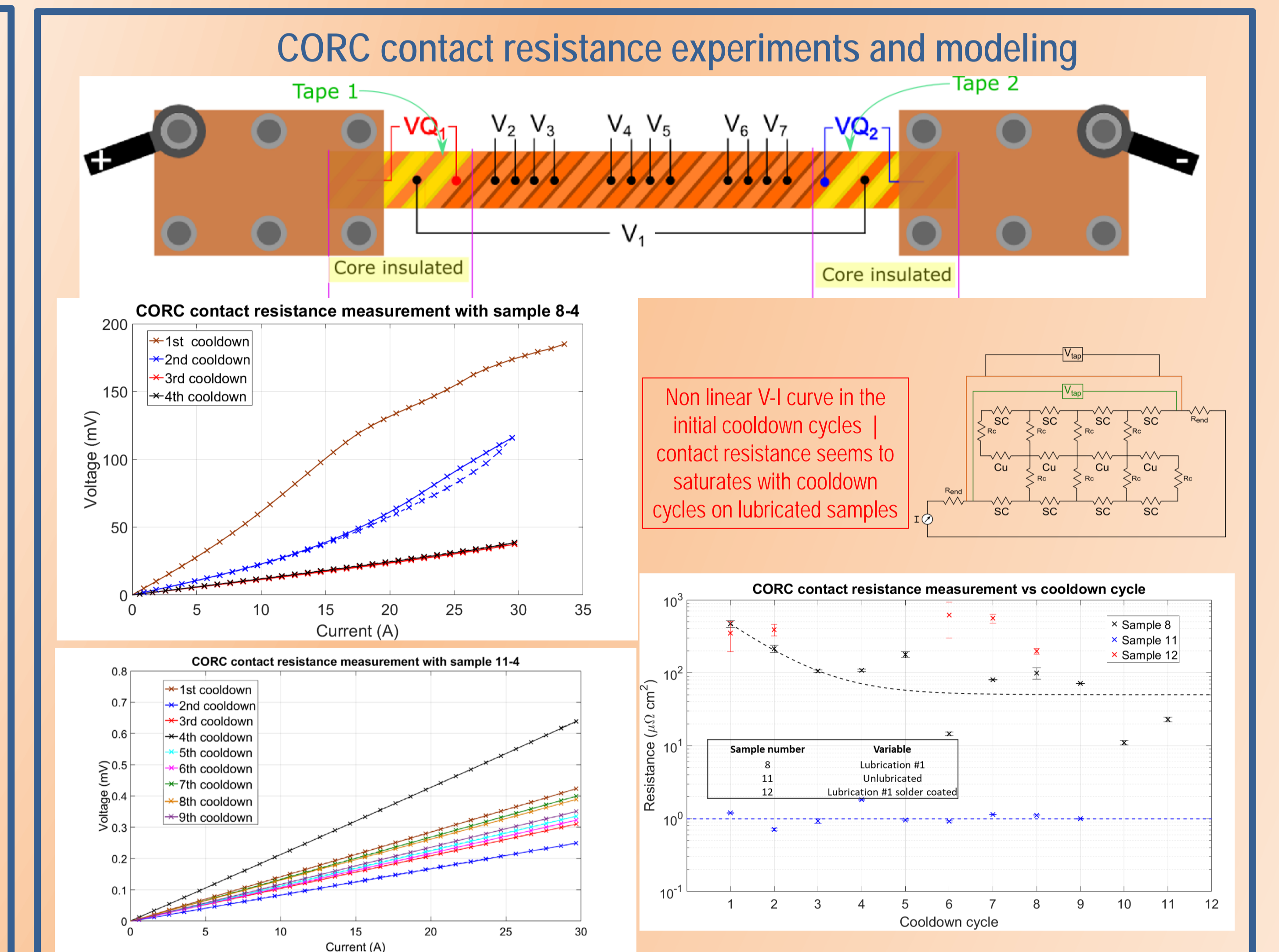
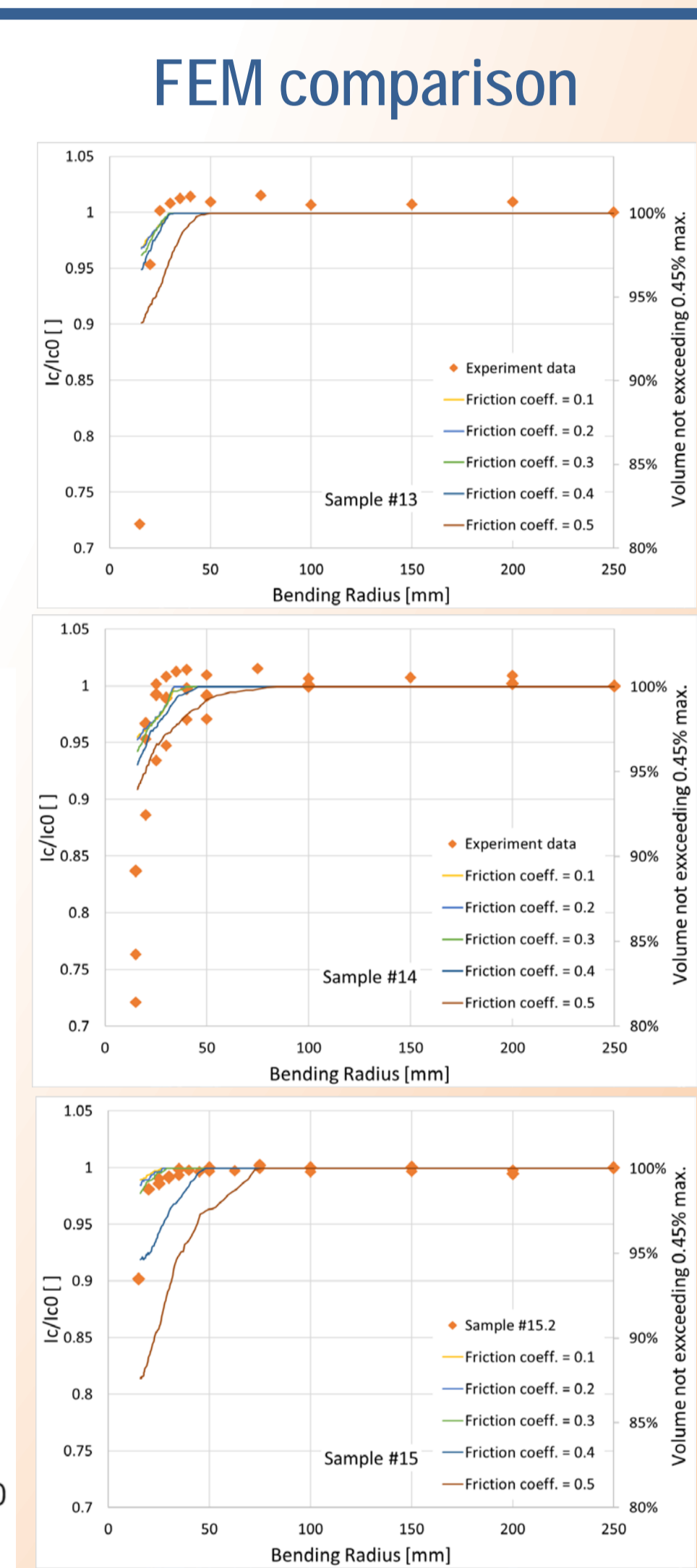
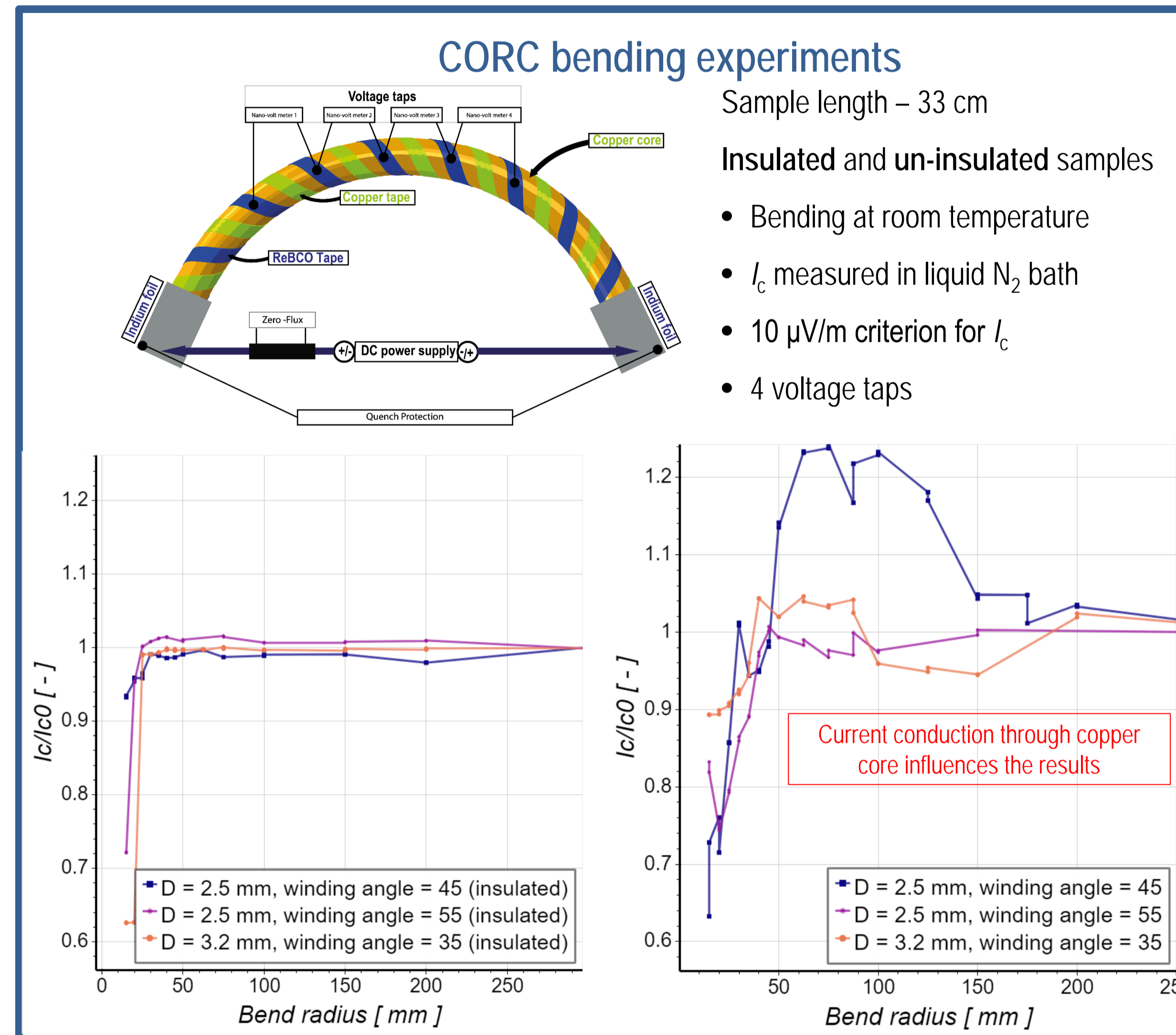
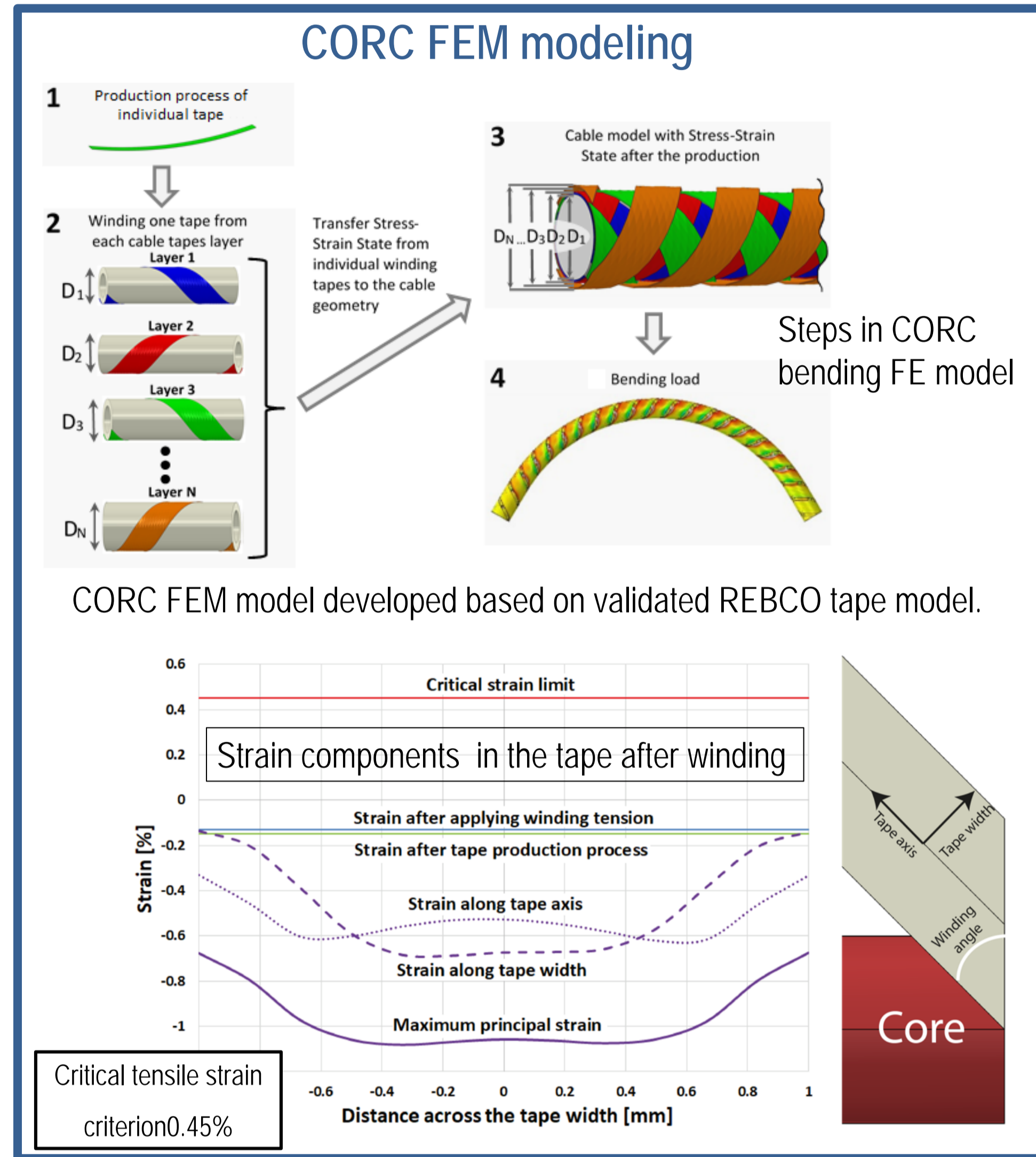
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## Abstract

A CORC® cable or wire is composed of several layers of helically wound HTS tapes on a round core with the winding direction reversed in each successive layer. A detailed Finite Element modeling of REBCO tape strain state is done to analyze mechanical behavior CORC cables and wires supported by experiments. Current sharing of REBCO tapes through the copper core is investigated with a simple electrical network model and experiments.



## Conclusions

- Flexibility of simplified CORC configurations, measurement of local voltage over the tape width and length and impact of lubrication on contact resistance are being studied.
- A detailed CORC® FE model is built and a validations are ongoing based on experimental data reaching qualitative agreement.
- Mode of failure in CORC cable is by combination of local tensile strain damage and kinking (compressive strain), similar to hard-way bending of REBCO tapes.
- Cooldown cycles influences the current sharing between REBCO tapes through the copper core in lubricated CORC cable.