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Type: **Oral presentation**

## **New coarse grained approach to study polymer networks**

*jeudi 18 mars 2021 14:20 (20 minutes)*

Resistance to fracture is an essential property for manufacturers, in particular those who work with elastomers. In a highly deformed crosslinked polymer, the force to which each chain is subjected depends on the local structure of the network (length of the chains, number of entanglements, local geometry, etc.). In general, a chain breaking is caused by extreme tension. Following a chain breaking, the prior stress supported by the chain is redistributed to its neighbors, who have their tensions increase and they will also end up breaking. An avalanche of ruptures follows which leads to a total rupture of the material. In order to study the behavior of elastomeric networks, we have developed models and numerical tools to simulate our systems at the crosslinked network scale. Our approach differs from historical analytical models by the use of coarse-grained models. One of our first results was to be able to measure the local stress distribution during elongation of the material.

### **Language**

English

### **Field**

Simulation - Mechanics - Polymers

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