Sensitivity study on model parameters 2

Date: 07/08/2020

Methods

The model parameters as found in *“Sensitivity study on model parameters 1”* were used. A model with ligament prestretch vectors defined from the superior to inferior part of the ligament was used. These vectors were not defined in “*Sensitivity study on model parameters 1*”. Sensitivity analysis performed with model du02.

Parameters of interest:
- Contact max aug: 10 or 40
- RCJ max aug: 0 or 10
- Timestepper aggressiveness 1 o 0
- Timestepper optimal iterations 10 or 50

Two sets of simulations:
1. ACL 1, 1.1 and 1.2
2. ACL: 0.7, 0.8 and 0.9

Simulation

- Prestretch application at 0.2.

Ran all combinations of the parameters of interest (Total = 48)

Outcome parameters

- Convergence
- Convergence time
- AP position

Results

Results presented in: Sensitivity study on model parameters 2.pptx

ACL values 1, 1.1 and 1.2

ACL values > 1.0 push the bones apart. A higher prestretch causes the AP position to be more anterior.

- Contact: max augmentations 40 = slightly faster runtime (probably negligible)

- RCJ: max augmentations	10 = slightly faster runtime (probably negligible)
- Timestepper: aggressiveness	1 = slightly faster (probably negligible)
- Timestepper: opt iterations	50 = slightly faster (probably negligible)

ACL values 0.7, 0.8 and 0.9

The simulations with ACL prestretch values 0.7 and 0.8 did not run because of negative jacobian detected.

- Contact max augmentation	No difference
- RCJ max augmentations	No difference
- Timestepper: aggressiveness	1 is slightly quicker.
- Timestepper opt iterations	No difference

Conclusion

Keep the original settings for:
- Contact: max augmentations = 40
- RCJ: max augmentations = 10
- Timestepper: opt iterations = 10

Addition of:
- Timestepper: aggressiveness = 1