New DEM modelling of knee joint for the study of ligament forces during deep flexion

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Problematic

➤ One of the current scientific challenges is to estimate, as accurately as possible, the **forces generated during flexion in the knee joint.**

➤ **Numerical modelling** is a way to do this**.**

➤ **Finite Element Method (FEM)** is a standard tool, but time consuming.

➤ **Discrete Element Method (DEM)** is an alternative tool, faster, but need to be mixed with **FEM**.
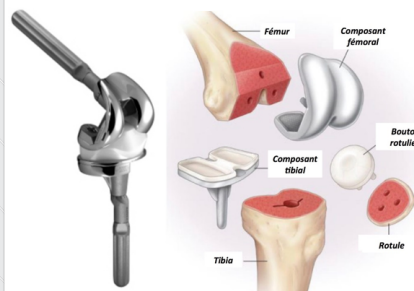
Previous works

➤ DEM model: already built but without contact between ligaments and bones or implants.

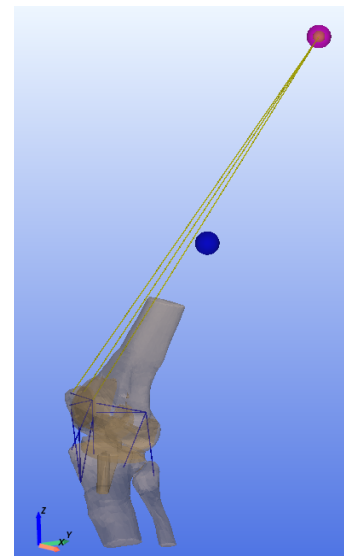➤ FEM model: already built and used for comparisons

Knee joint
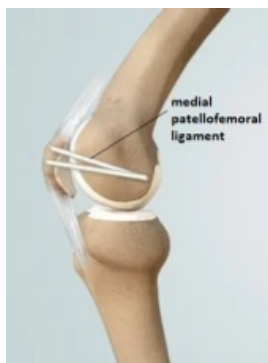
Knee Prosthesis

DEM model

Aims of the project

➤ Study the state of the art of this modelling approach

➤ Develop a numerical modelling of prosthetic knee joint, taking into account contact between ligaments and bones or implants