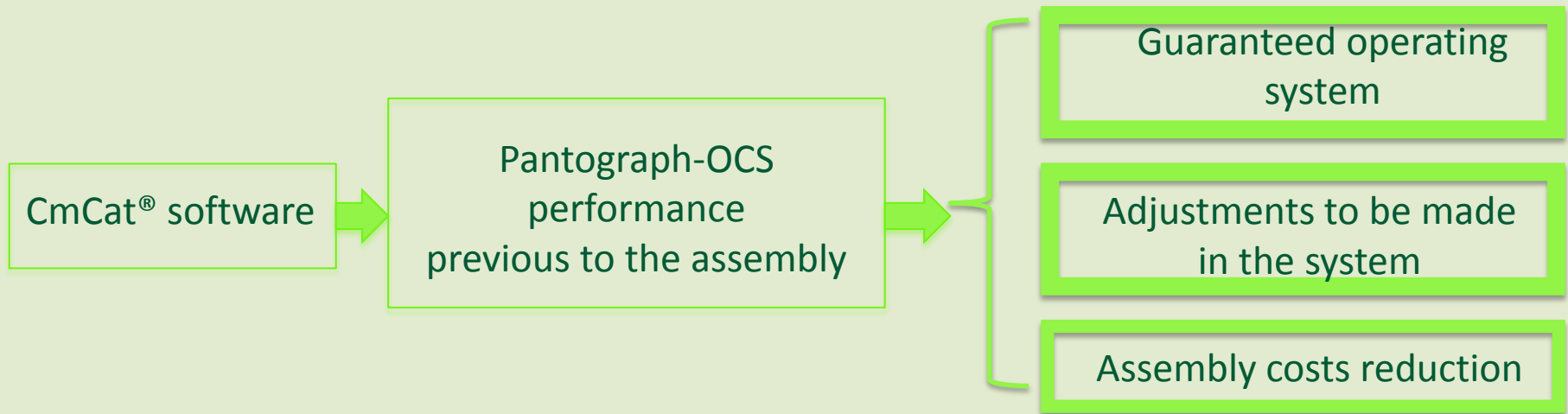


Pantograph-Overhead contact system interaction



ELECTRIFICACION y
ESTUDIOS
FERROVIARIOS

Pantograph-overhead contact system (OCS) interaction



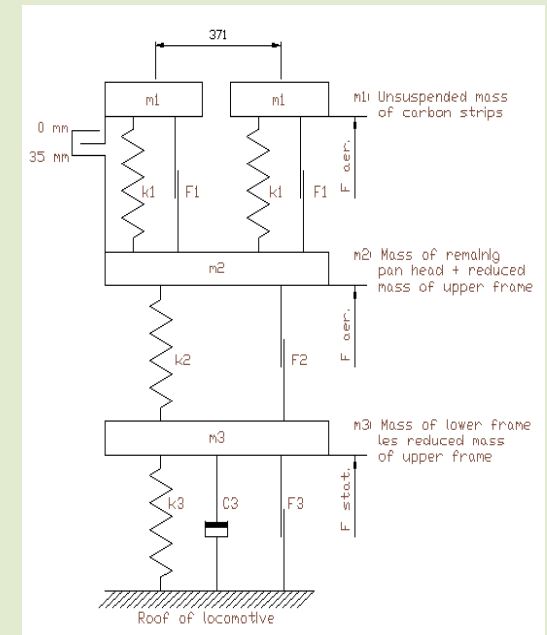
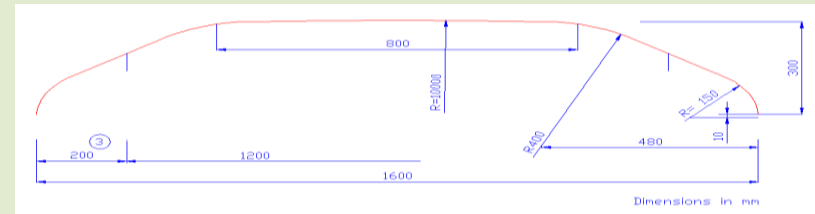
The aim of the simulation is to evaluate the overhead contact system performance, for both **flexible or rigid OCS**, in such way that it can be guaranteed the performance at a given speed and span length.

Compliance verification of the obtained results with the technical Interoperability specifications.

Components Simulation

Pantograph

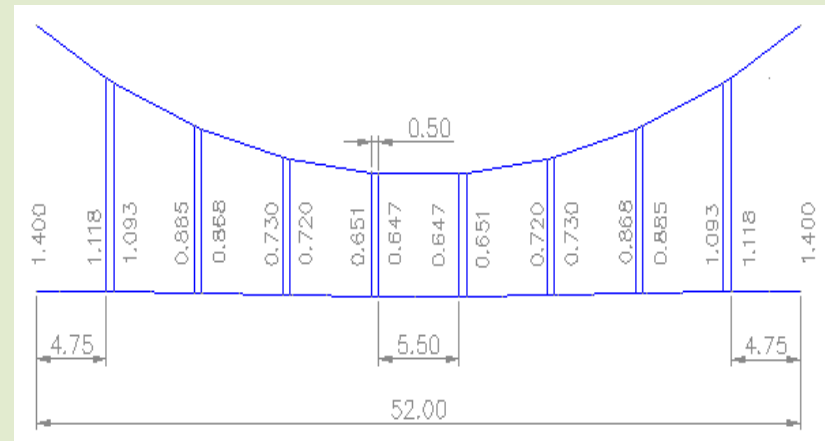
- Creation of models: masses group, springs, shock absorbers, friction strength, static effort and dynamics coefficient .
- Number of freedom pantograph degrees
- Length of contact area from the plate
- Distance between plates
- Pantograph weight masses
- Associated rigidity with each one of the masses
- Maximum and minimum displacement of the plates
- Friction coefficient between plates and contact wires



Elements Simulation

Flexible overhead contact line

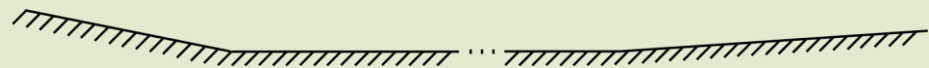
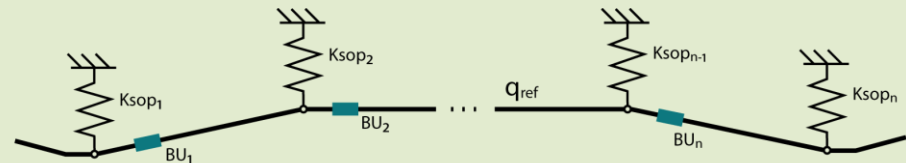
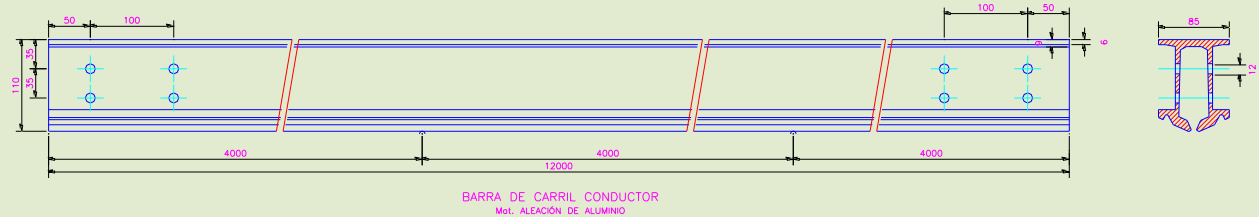
- Modelization: A set of small length elements, mechanical properties, weight per unit length, mechanical stresses.
- Number and length of spans
- Suspensions cables
- Messenger wire
- Contact wire
- Conductors height
- Bracing arms



Elements Simulation

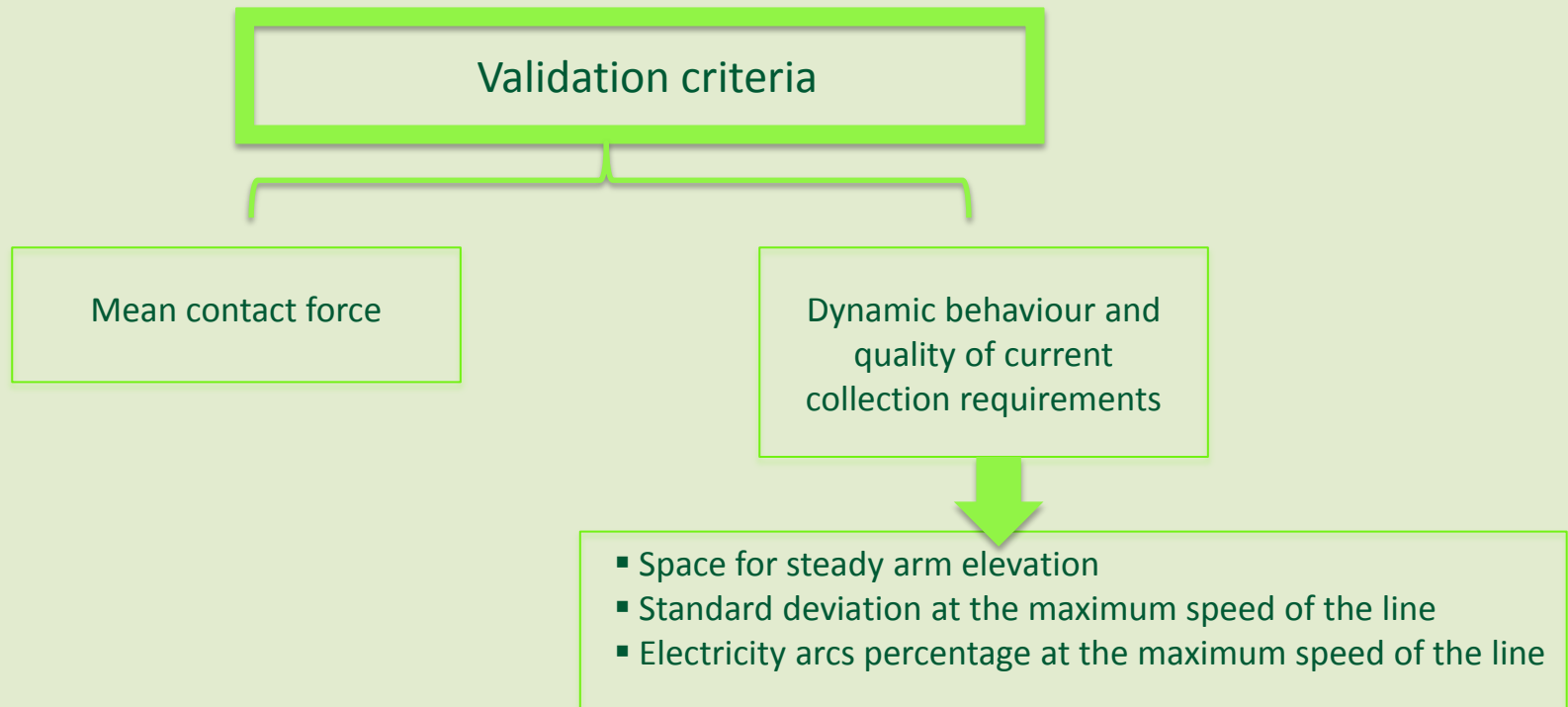
Rigid overhead contact line

- Sectional area of the rigid overhead contact line profile
- Profile density
- Height
- Length type
- Weight per meter
- Inertia moment
- Resistance moments
- Elasticity modulus
- Expansion coefficient and resistivity



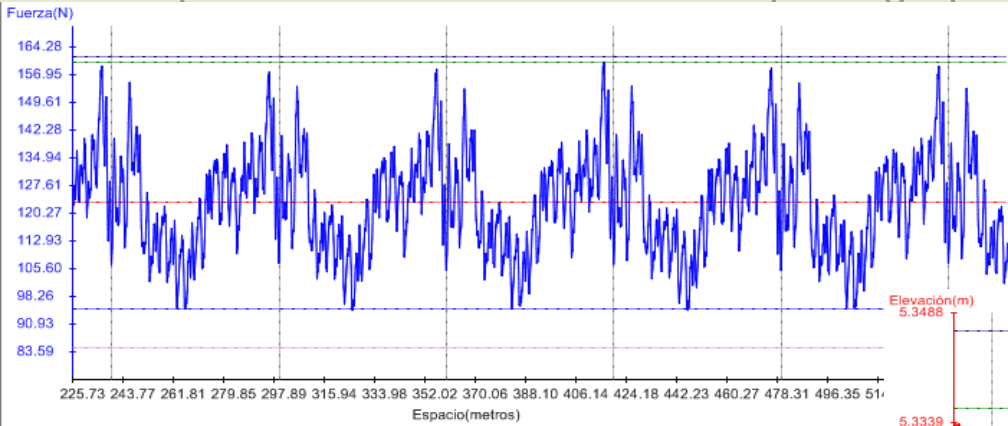
Validation Criteria

To validate the functioning of the overhead contact line it will consider the Technical Specifications for Interoperability (TSI), from energy subsystem of the European conventional rail system (Commission Decision of 26-04-2011) and EN 50119-2009.

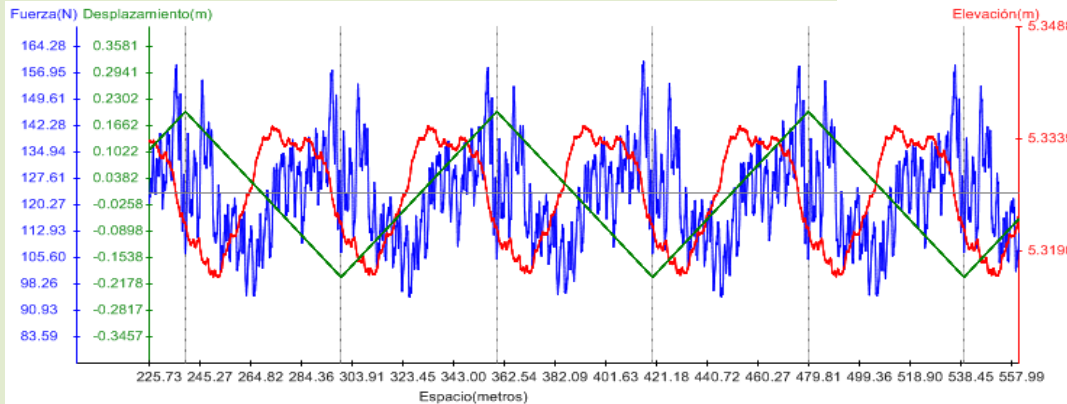
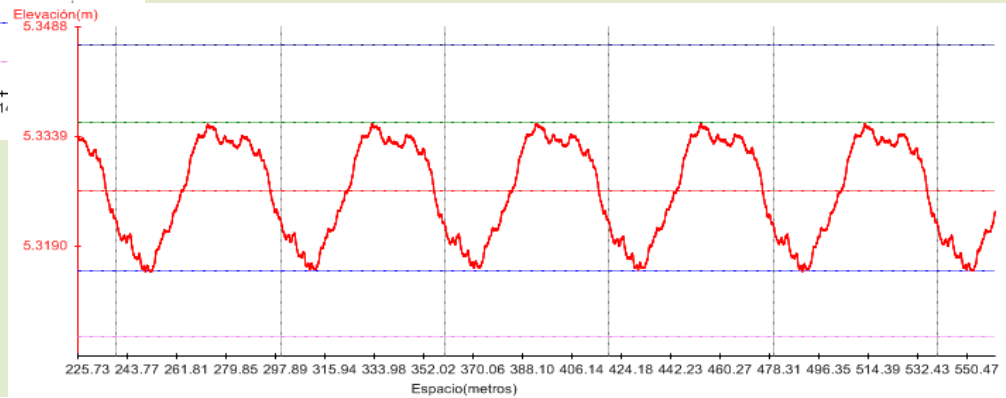


Simulation Results

Graphic of overhead contact libe pantograph efforts



Contact wire elevation



Graph of joint effort, contact wire elevation and decenterings