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A model for the mechanical behaviour of the railway track in the lateral plane

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Highlights

• An equivalent model for the railway track behaviour in the lateral plane is built starting from the transmission modes of the inner forces.

• Bending moment is transmitted without deforming sleeper and fasteners and is composed of two parts with fixed ratio

• Longitudinal and transversal shear forces are originated by two independent mechanisms.

• The model constitutive properties are consistent with the real track behaviour since were derived by an averaging and limiting processes of the strain energies pertaining to the transferring modes, without any kinematical *a priori* assumption.

• Two closed form corrective solutions are given to take into account the local effects due to applied loads and boundary conditions altering periodicity in track response.

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