Supplementary Material

Table 4. Notations and values of freight cars properties used in the train-track-bridge model

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Box | Tank | Flat | Hopper | Covered Hopper | Gondola | Unit |
| $$M\_{c}\\_c$$ | car body mass  | $$10.4E+4$$ | $$10.3E+4$$ | $$11.5E+4$$ | $$11.5E+4$$ | $$11.5E+4$$ | $$10.5E+4$$ | kg |
| $$J\_{c}\\_c$$ | car body mass inertia | $$2.2E+5$$ | $$2.4E+5$$ | $$2E+5$$ | $$2.2E+5$$ | $$2.3E+5$$ | $$2.1E+5$$ | kg.m2 |
| $$c\_{s2}\\_c$$ | secondary suspension damping | $$40$$ | $$38$$ | $$45$$ | $$35$$ | $$33$$ | $$36$$ | kN.s/m |
| $$k\_{s2}\\_c$$ | secondary suspension stiffness | $$600$$ | $$630$$ | $$530$$ | $$700$$ | $$730$$ | $$680$$ | kN/m |
| $$M\_{bogie}\\_c$$ | bogie mass | $$3270$$ | $$3400$$ | $$3200$$ | $$3280$$ | $$3270$$ | $$3200$$ | kg |
| $$J\_{bogie}\\_c$$ | bogie mass inertia | $$1484$$ | $$1500$$ | $$1400$$ | $$2420$$ | $$2440$$ | $$2410$$ | kg.m2 |
| $$c\_{s1}\\_c$$ | primary suspension damping | $$37$$ | $$35$$ | $$40$$ | $$31$$ | $$30$$ | $$33$$ | kN.s/m |
| $$k\_{s1}\\_c$$ | primary suspension stiffness | $$1300$$ | $$1400$$ | $$1100$$ | $$1800$$ | $$1900$$ | $$1600$$ | kN/m |
| $$m\_{w}$$ | wheel mass | $$1050$$ | $$1200$$ | $$1050$$ | $$1018$$ | $$1018$$ | $$1050$$ | kg |
| $$l1\\_c$$ | Axle spacing within one bogie  | $$1.778$$ | $$1.778$$ | $$1.778$$ | $$1.778$$ | $$1.778$$ | $$1.778$$ | m |
| $$l2\\_c$$ | Axle spacing within different bogies  | $$12.32$$ | $$12.43$$ | $$16.92$$ | $$7.19$$ | $$12.17$$ | $$15.20$$ | m |