SERVICE LIMIT STATES FOR RAILWAY BRIDGES IN NEW DESIGN CODES IAPF AND EUROCODES

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ABSTRACT
The new and enhanced requirements of bridges for high-speed railway lines have prompted new requirements for design of structures. These have been studied at national and international level within Europe (ORE, ERRI, UIC) and have originated new engineering codes for actions and design requirements. Between these we may cite the italian code (FS-xxx, 2000), the Eurocodes EN1991-2 and EN1990-A2. An important feature in these codes is the consideration of service limit states. These limit states are unique to railway bridges and are often the critical features conditioning the design. Among these limits are the maximum of displacements and stresses in the rail related to track-bridge interaction, and the limit of accelerations at the track. It must be stressed that some of these service limit states are indeed ultimate limit states related to safety of rail traffic, and hence of the utmost importance. In this work we shall review these limitations, the methods proposed for calculation, and their relevance for design.