



## **BALLAST FLYING MECHANISM AND SENSITIVITY FACTORS ANALYSIS**

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*Abstract- Ballast flying problems obsess the ballasted high speed railway, its microscopic mechanics is less of discovered. In the paper, the railway ballast particle force equilibrium is analyzed through basic mechanics and mathematic formula, and a model is set up to discover the factors and influence. The microscopic ballast flying model is used for ballast bed geometry and ballast shape optimization, and guide the ballast flying countering methods. Results show that ballast flying particle is correlated with ballast shape and mass, especially the ballast shape mass ratio corresponds to operation speed. Ballast interlock ability governs the ballast flying possibility and severity. Ballast flying possibility increases with ballast bed acceleration. The paper focus on ballast particle force equilibration, shape and mass, under the condition of vibration and wind effects, the ballast flying mechanism is analyzed and discussed with related counteracting methods presented.*

**Index terms:** Ballast flying, high speed railway, sensitivity factors analysis.