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Aerodynamics and countermeasures of train-tail swaying inside single-line tunnels

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Article Content Structure

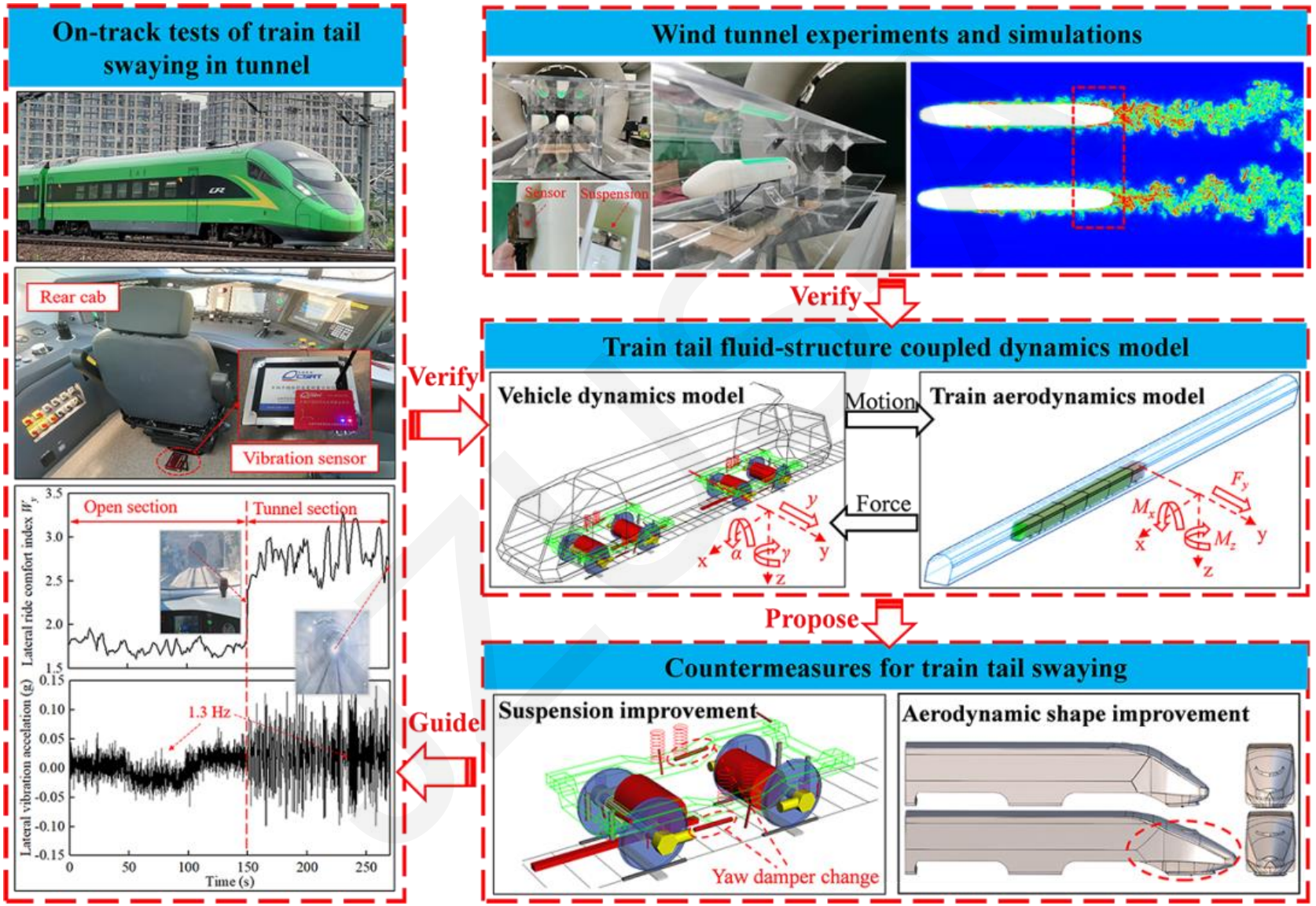


Fig. 1. Research flow of this study.

Simulation Model

■ Train fluid-structure coupled dynamic models

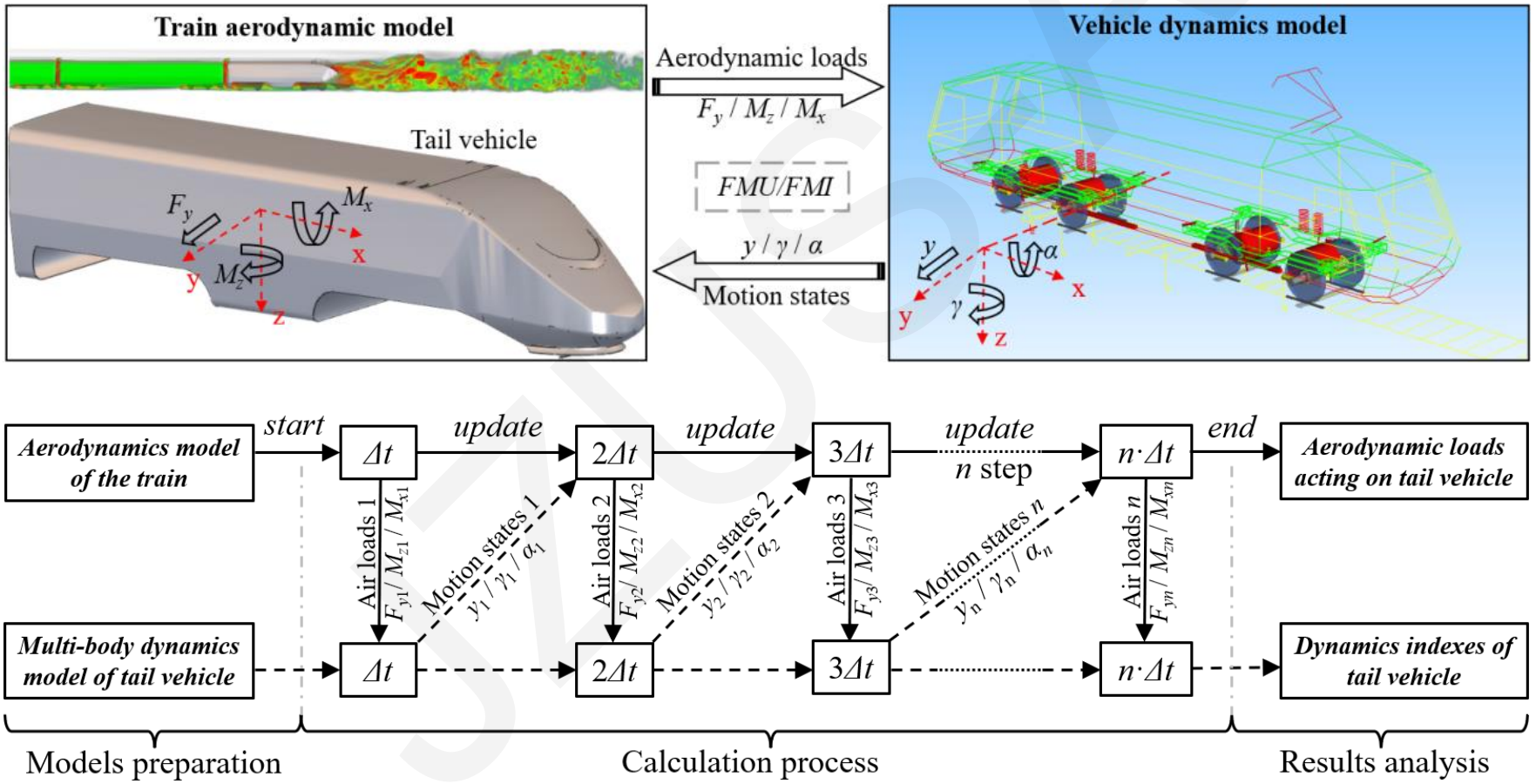


Fig. 2. Fluid-structure coupled simulation for train tail vibration.

Simulation Analysis

Analysis of wake characteristics

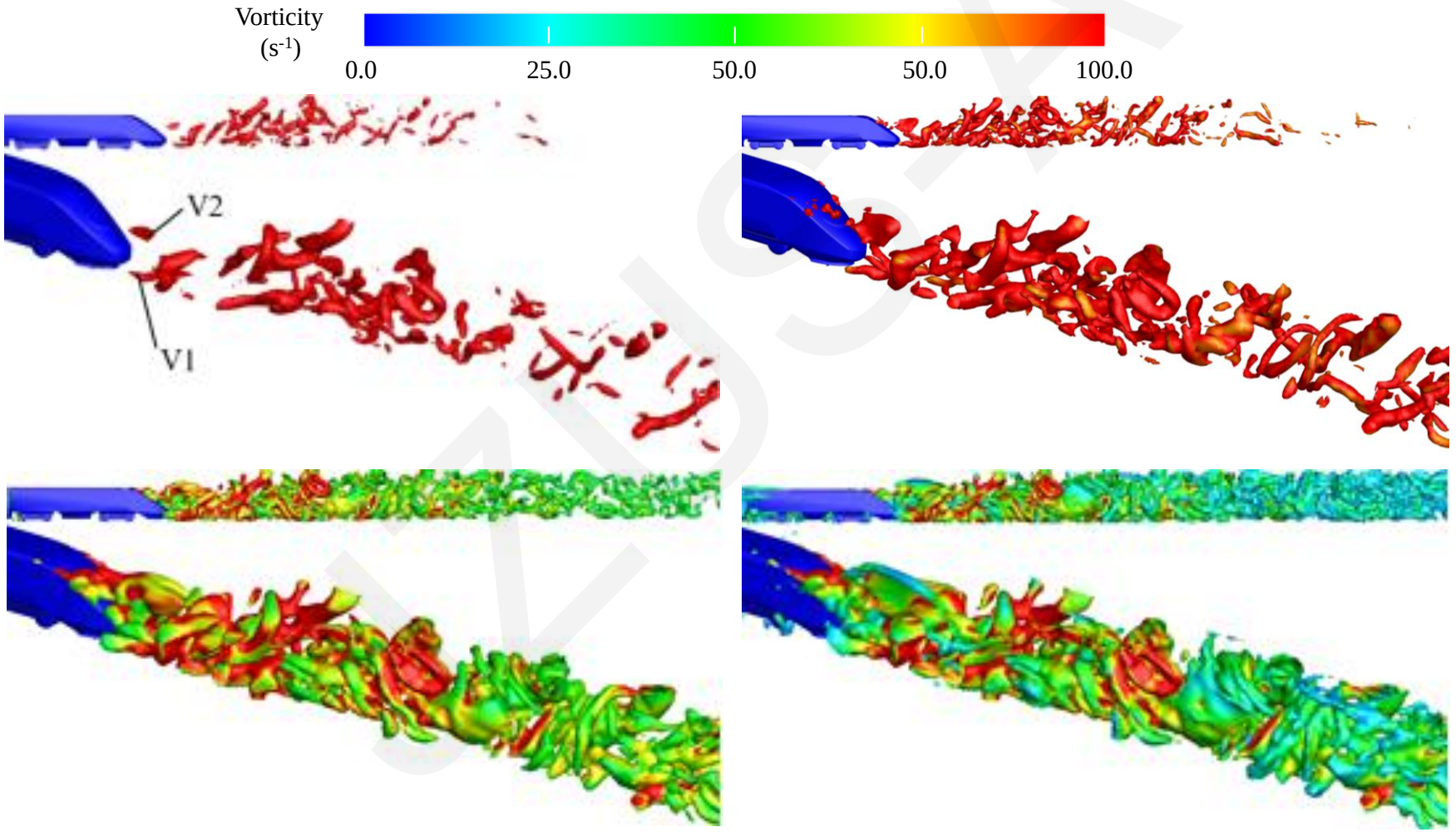
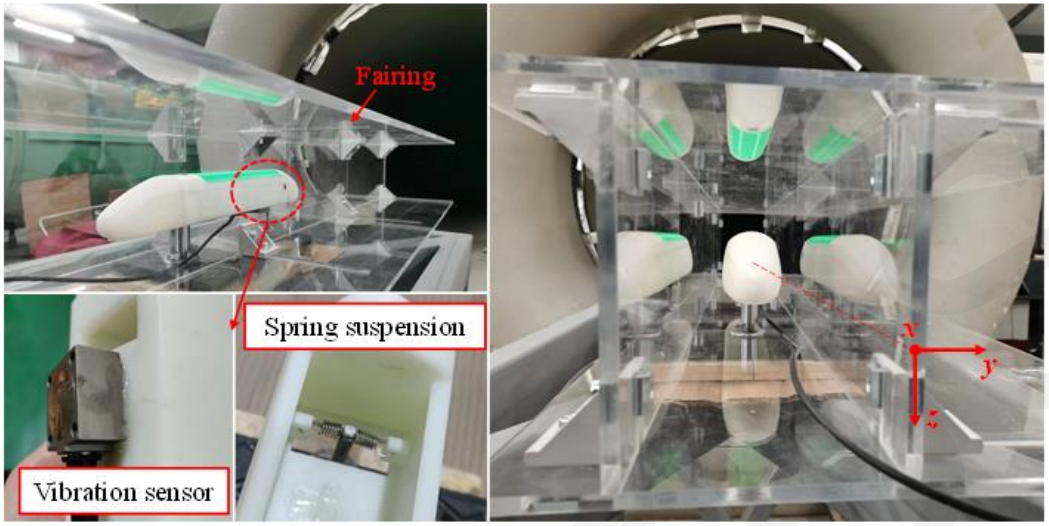
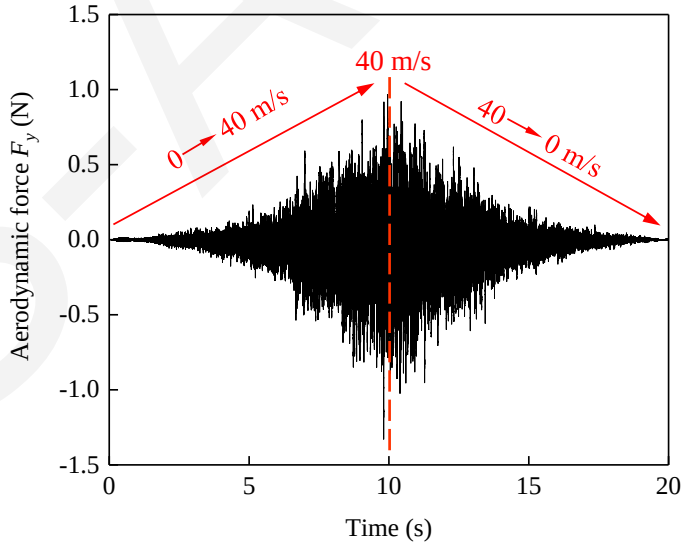


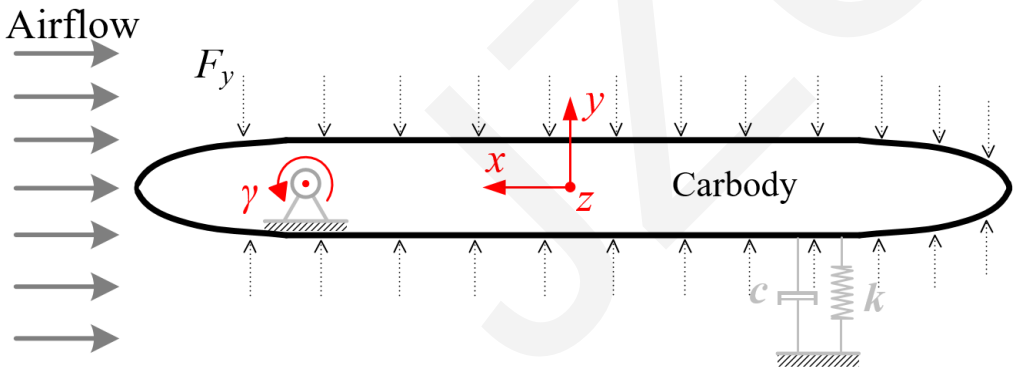
Fig. 3. Wake vortex structures inside the tunnel.

Experimental Analysis

■ Wind-tunnel experiment platform







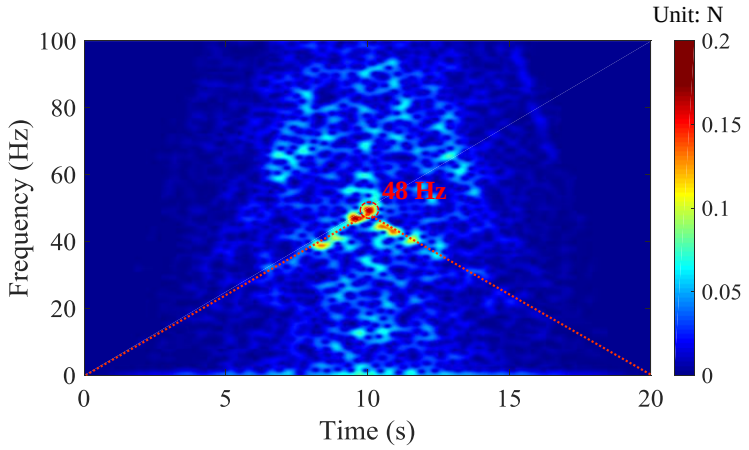
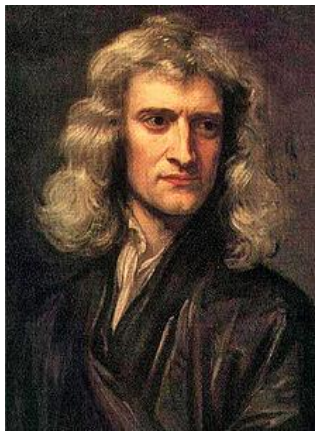


Fig. 4. Lateral acceleration measurement of the train tail.

Conclusions

- Aiming to improve train-tail swaying of 160 km/h EMUs inside single-line tunnels, we studied the aerodynamic performance of the train tail by experiments and simulations. The influence mechanism of train-tail swaying on train-wake characteristics was revealed. This permitted us to suggest countermeasures for train-tail swaying inside single-line tunnels, with regard to two key aspects.



I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, while the great ocean of truth lay all undiscovered before me.