Measures and Evaluation by Track for Decreasing Environmental Vibration in Shinkansen

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We were confronted with the ground vibration problem of the housing areas located over the Shinkansen tunnel which has thin overburden. At first, as measures in the track, the rail pad was exchanged for low elastic type to decrease the track stiffness. As a result, the vibration of 50Hz band has decreased. However, the vibration that originates in the rail has not decreased, since it had a remarkable ruggedness of wavelength 2.5m. Then, we executed rail grinding of the long wavelength as smoothing the rail ruggedness. Consequently, the vibration of 12.5Hz that originates in the rail ruggedness has decreased this time. Therefore, it has been revealed that these measures are effective to decrease the ground vibration.