Dynamic Response of a Moving Vehicle to a Sudden Gust of Wind

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In order to analyze the behavior of a railway vehicle that is subjected to a sudden gust of wind, we have conducted wind tunnel tests and running tests using a 1/10th scale train model. Moreover, using a full-vehicle simulation program that we have developed in order to analyze the behavior of railway vehicles under crosswinds, we have examined the effects of the rapid changes of wind force on overturning or wheel unloading ratios. As a result, it has been revealed that a sudden increase in wind force in less than 3 seconds can affect vehicle dynamic response considerably.