55. Characterizations of string stability with applications to automobile platoons

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The notion of String stability characterizes the longitudinal safety margins of automobile platoons. In this work, we provide two characterizations of string stability. One characterization offers a physical interpretation of string stability. The second characterization provides a simplified mathematical framework to analyze the safety margins of automobile platoons. We illustrate the practical and theoretical significance of each characterization. Additionally, we provide how these ideas support the design of Adaptive Cruise Control (ACC) systems and Cooperative Adaptive Cruise Control (CACC) systems.