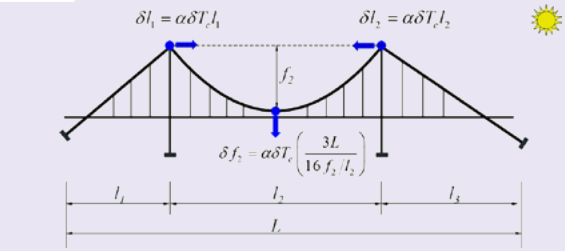
COMMENDATION MERIT

Analytical solution to temperature-induced deformation of suspension bridges



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Aims of the research / Paper Abstract:

This study investigated the mechanisms of temperature-induced displacement of suspension bridges, and derived general analytical formulas of the thermal response of different components of the suspension bridge. The formulas was verified using the field monitoring data of the 1377-m main span Tsing Ma Bridge at Hong Kong and 1991-m main span Akashi Kaikyo bridge in Japan.

Brief on unusual features

This paper derives a simple and unified analytical solution in the form of a 1D equation, i.e., $\delta l = \alpha \cdot \delta T \cdot L_e$, where L_e is the effective length of the component. A simplified version is illustrated in the following figure.