

Modeling of Dynamic Characteristics for Transmission Tower Line System Using the Free Interface Modal Synthesis

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ABSTRACT

Dynamic characteristics are essential to predict and study the responses of transmission tower line system under dynamic actions, e.g., fluctuating winds. To efficiently solve the dynamic characteristics of the tower line system subjected to winds, a modal-synthesis-based modeling method is developed by the free interface theory. Taking a system composed of three towers and two-span conductors as the example (Fig. 1), its natural frequencies and modes under averaging winds are obtained depending on the tower-line component dividing, interface compatibility conditions between the tower and line, and the component modal synthetizing (CMS). Comparing the free interface CMS method with the finite element method, it is demonstrated that the application of CMS method significantly improves the computation efficiency and the calculation results show highly coincidence.

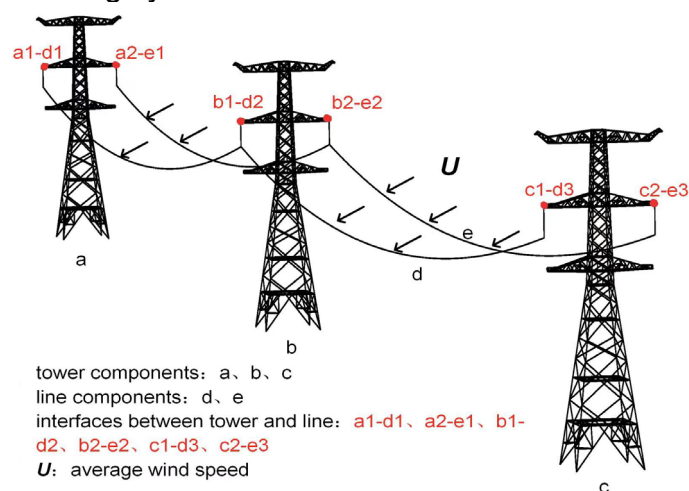


Fig. 1 An example of tower line system and its components division

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