Influence Mechanism Of Initial Temperature Difference On Construction Response Of Spatial Structure

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The sequence and initial temperature of structure construction directly affect the response of structure construction forming state. Two models of uniform temperature field and non-uniform temperature field are usually used to analyze the temperature action in construction process. These two temperature modes ignore the difference of temperature effect caused by different installation time of components, and the temperature stress and deformation of spatial structure accumulated during the formation of statically indeterminate constraints, which will lead to a great difference between the simulated and actual structural responses. In this paper, the influence mechanism of initial temperature difference on construction response of spatial structure is studied. The initial temperature of the construction section was determined according to the construction progress and statically indeterminate formation sequence, and then the value of temperature action was determined according to the uneven temperature field. The structural response under different temperatures was compared, and the influence mechanism of initial temperature difference on the construction response of spatial structure was discussed. Based on the construction monitoring of Nanshan Science and Technology Innovation Center project , this paper demonstrates the influences of structural responses by taking initial temperature difference on the response simulation in construction phase into account or not, which obtains the cumulative size of temperature stress and deformation during the statically indeterminate formation process of space truss structure. The influence degree and mechanism of initial temperature difference on the construction response of space structure are demonstrated from the perspective of actual measurement and simulation, which provides a theoretical basis for the optimization of construction sequence and construction time.