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The quasi-axisymmetric stellarator CFQS is under construction as a joint project of the National Institute for Fusion Science, Japan and South-west Jiaotong University, the People's Republic of China. To confirm the structural reliability of vacuum vessel and understand its mechanical behavior, we have performed finite element analysis when it's exposed to several loads, such as vacuum force, thermal stress and electromagnetic force. This picture is a part of analysis results and shows displacement and stress. (Sho NAKAGAWA *et al.*, Plasma and Fusion Research, Vol. 15, 2405066 (2020) <http://www.jspf.or.jp/>)