Report

This paper is relevant for the community working on supersymmetric Wilson loops in holography. The authors investigate the vacuum expectation values of 1/2-BPS Wilson loops in maximally supersymmetric Yang-Mills (MSYM) theory defined on d-dimensional spheres. They focus on the holographic duals of these theories, particularly back-reacted spherical D-branes, evaluating the holographic Wilson loops to next-to-leading order. The paper highlights novel treatments of divergences due to non-constant dilaton profiles and presents a framework to match the subleading scaling of the Wilson loops with string theory predictions.

The manuscript is generally well-structured with clear sections dedicated to the theoretical setup, technical computation, and specific cases for d=2,3,7. The introduction comprehensively motivates the work and situates it within the broader context of gauge/gravity duality. Technical details, though extensive, are provided systematically, such that the paper can be used as reference for further developments in the field.

One tiny improvement would be to move the comment about instantons being exponentially suppressed at large N from page 25 to page 5, where such fact is first mentioned. Apart from that, the computations appear robust and I could not find mistakes or typos. The authors were clear regarding what they did and did not manage to answer, also providing a list of open questions and problems to address.

I recommend the paper for publication in its current form. The work is a valuable contribution to the study of holographic Wilson loops and non-conformal gauge theories.