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# Negative Energy, Instability, and AdS/CFT

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## Abstract

The AdS/CFT correspondence conjecture has been a powerful tool in elucidating our understanding of quantum gravity, gauge theories, and the holographic relationship between them. Here I show that supergravity admits solutions that have arbitrarily negative energy on topologically identified  $\text{AdS}_5 \times Z_k$  for  $k \geq 4$ . The AdS/CFT correspondence conjecture has been a powerful tool in elucidating our understanding of quantum gravity, gauge theories, and the holographic relationship between them. Here I show that supergravity admits solutions that have arbitrarily negative energy on topologically identified  $\text{AdS}_5 \times Z_k$  for  $k \geq 4$ . These solutions describe bubbles that are regular up to curvature singularities due to smeared D-3 branes. I discuss the implications of these solutions for the AdS/CFT correspondence conjecture.