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## Testing Theories of Gravity via Shadow of a Magnetised Accretion Flow onto a Black Hole

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The upcoming sub-millimetre VLBI images of Sgr A\* by the EHT Collaboration are expected to provide critical evidence for the existence of this supermassive black hole. In the near future, strong field images could be used to test both deviations from General Relativity as well as different models for the compact object at the Galactic Centre. In this work we assess our present and future ability to determine whether such images correspond to a Kerr black hole, a dilaton black hole from an alternative theory of gravity or a boson star. We perform GRMHD simulations and use GRRT calculations to generate synthetic images of the magnetised accretion flow onto each of these objects. We provide synthetic images based on the 2017 EHT and future VLBI observations and use image metrics to quantify our ability to distinguish between these objects.

### Summary

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