Towards black hole movies with the Africa Millimetre Telescope (AMT)

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The Event Horizon Telescope (EHT) is a network of antenna's across the globe that is used to image super massive black holes (SMBHs). These antennas observe together in very long baseline interferometry (VLBI) at a frequency of 230 GHz to produce a single image. Since the release of the first image of M87* in 2019 and subsequently the image of Sgr A* in 2022 by the EHT collaboration, the focus has shifted to not only taking better resolved images such as in the case of Sgr A* but also to dynamically image blackholes. This has led to a search for possible sites to extend and fill in the gaps within the EHT network. The Khomas highlands of Namibia have been found to have optimal conditions for astronomy and thus has been identified as one such area to add an observatory. The observatory shall consist of a 15 m diameter telescope called the Africa Millimetre Telescope (AMT). Two sites within the Khomas highlands have been identified as potential sites, this being the Gamsberg Mountain and H.E.S.S. site. The Gamsberg Mountain has an elevation of 2347m above sea level (a.s.l) and is an iconic site with the top of the summit relatively flat. Despite attempts to built an observatory as early as 1970, no facilities have ever been buillt, there is no power and water utilities ontop and the road to the submit of the mountain is in a bad state. The H.E.S.S. site makes up the H.E.S.S. observatory, which is world leading gamma ray observatory. The H.E.S.S. site sits at an elevation of 1800m a.s.l and already has power and water utilities. Precipitable water vapour (PWV) in the atmosphere is the main source of opacity when observing at millimeter to submilimeter waves. Millimetre waves either get absorbed or scattered by PWV in the atmosphere and therefore results in the signal being attenuated and delayed. For this reason, before a millimeter observatory can be built on one of the two sites, PVW measurements at the two potential sites have to be taken and analyzed. In this presentation, previous results at both sites and the status of new PWV measurements being taken will be discussed.