

Within class of generic black holes there are extremal black holes (with vanishing Hawking temperature T) and vanishing horizon area A_h , but with finite A_h/T ratio, the Extremal Vanishing Horizon (EVH) black holes. We study the near horizon limit of a four dimensional EVH black hole solution to a generic (gauged) Einstein-Maxwell dilaton theory and show that in the near horizon limit they develop a throat which is a pinching orbifold limit of AdS3. This is an extension of the well known result for extremal black holes the near horizon limit of which contains an AdS2 throat. We show that in the near EVH near horizon limit the pinching AdS3 factor turns to a pinching BTZ black hole and that this near horizon limit is indeed a decoupling limit. We argue that the pinching AdS3 or BTZ orbifold is resolved if the near horizon limit is accompanied by taking the 4d Newton constant G_N to zero such that the Bekenstein-Hawking entropy $S=A_h/(4G_N)$ remains finite. We propose that in this limit the near horizon EVH black hole is dual to a 2d CFT. We provide pieces of evidence in support of the EVH/CFT correspondence and comment on its connection to the Kerr/CFT proposal and speculations how the EVH/CFT may be used to study generic e.g. Schwarzschild-type black holes.