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Counting Embedded Spheres with the Same Persistence

In this talk I extend earlier collaborative work with Catanzaro, Fasy, Lazovskis, Malen, Reiss, Wang and Zabka (<https://arxiv.org/abs/1909.10000>) on inverse problems in TDA. In this new work with my PhD student, Jordan DeSha, we provide a closed-form formula for the number of unbraided height equivalence classes (HECs) of embedded two-spheres with a prescribed level-set barcode arising from projection onto the z-axis. In this setting, two embedded spheres are deemed height equivalent if they are related by a z-level set preserving isotopy. This establishes a conjecture outlined in the earlier paper with Catanzaro, et al.