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Studying the co-evolution of early-type galaxies and their super-massive black holes through the eyes of VEGAS

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Galaxy-galaxy interactions and mergers are spectacular phenomena which produce a variety of complex remnants.

These features manifest as e.g. ripples, shells, streams, tidal tails, and are commonly referred to as “fine structures”.

Their prominence is a function of time, because the galaxy potential progressively relaxes after a merger: fine structures are destined to fade out in a few Gyrs.

The morphological characterization of interaction remnants therefore provides an independent method to measure the age of an early-type galaxy (ETG), an otherwise difficult task given that their stellar population is rather uniformly old.

We present a preliminary study linking the temporal co-evolution of fine structures and of the super-massive black hole binaries which are assembled in the same merger which shaped the ETG, and we discuss it in the context of the hierarchical galaxy formation scenario.

We intend to exploit the data from VEGAS — a deep, large-field survey of Early-type Galaxies in the Southern hemisphere based on the VST telescope — to characterize faint ($25-29 \text{ mag/arcsec}^2$) fine structure features, and expand our study to a statistically significant ETG sample.

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