

WST - the Wide-field Spectroscopic Telescope: surveying the Universe in the 2040's and beyond



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Back-in-time Void Finder: dynamical void finding for new generation Cosmology

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WST will push the boundaries of our understanding of the Universe, providing an unprecedented amount of data from regions previously unreachable by any observational survey. Next-generation datasets will require a new suite of models and tools designed for the next level of precision cosmology: cosmic void studies are no exception.

I present a novel dynamical void-finding algorithm, the *Back-in-time Void Finder*, specifically developed for precision cosmology. This method reconstructs the tracer velocity field to identify cosmic voids as the points of maximum divergence in the displacement field, effectively pinpointing regions from which the largest mass outflows originate. Optimized for large-scale surveys, the algorithm produces catalogues of pure voids, tailored for various cosmological applications such as the void-galaxy cross-correlation function, void size function, and velocity profile analyses.

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