# Blast: Beyond Limber Angular power Spectra Toolkit. A fast and efficient algorithm for accurate 3x2pt analysis

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**Abstract**

The accurate computation of 3x2pt statistics plays a crucial role in understanding the large-scale structures in the universe using cosmological surveys. While the Limber approximation has traditionally provided a simple and efficient method for this computation, its limitations become apparent in the context of recent and future surveys, demanding more precise and efficient techniques. In this work, we propose a novel, computationally fast, approach to compute 3x2pt statistics without relying on the Limber approximation, ensuring both efficiency and precision.

Our method addresses the challenge of dealing with a 3D integral with Bessel functions by employing a combination of techniques, effectively handling the oscillatory nature of the Bessel functions.

An important aspect of our approach is its compatibility with automatic differentiation techniques, facilitating likelihood exploration and maximization even in high-dimensional parameter space. This feature enhances the usability of our method in cosmological parameter estimation tasks.

Overall, our proposed method offers a promising solution for accurately computing 3x2pt statistics in upcoming cosmological surveys, addressing the shortcomings of the Limber approximation and providing a valuable tool for extracting information from large-scale structure. In particular, the tool provided will be of critical importance for the Euclid survey, enabling the core scientific analyses to be performed using modern statistical inference techniques.