SOVEREIGN: To what extent does the S* selection mechanism improve the accuracy and throughput of code generation on Codef

SOVEREIGN Research Kernel
Autonomous draft — Owner review required before publication

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Abstract

We report the observation of gravitational waves from two binary black hole coalescences during the fourth observing run of the LIGO–Virgo–KAGRA detector network, GW241011 and GW241110. The sources of these two signals are characterized by rapid and precisely measured primary spins, non-negligible spin–orbit misalignment, and unequal mass ratios between their constituent black holes. These properties are characteristic of binaries in which the more massive object was itself formed from a previous binary black hole merger, and suggest that the sources of GW241011 and GW241110 may have formed

1 Introduction

Analysis of: GW241011 and GW241110: Exploring Binary Formation and Fundamental Physics with Asymmetric, High-Spin Black Hole Coalescence. Research goal: To what extent does the S* selection mechanism improve the accuracy and throughput of code generation on Codeforces problems for LLMs like DeepSeek-R1 versus o1-preview under adversarial input perturbations?.

2 Methodology

Multi-query arXiv search (1 parallel queries, Relevance-sorted). TF-IDF cosine semantic verification (bigrams, threshold=0.15). NIM nv-embedqa-e5-v5 (dim=1024) for semantic indexing. Tribunal v2: 3-role parallel review (SKEPTIC/VALIDATOR/SYNTHESIZER) with revision round if score $<$ 6.5.

3 Results

3 papers retrieved. 9 claims extracted, 9 verified. Tribunal: 6.3/10 → REVISE (revision_round=1). Policy: SOFT_APPROVE.

4 Uncertainties

NIM free tier latency varies. TF-IDF verification is a weak signal. arXiv Relevance ranking is query-dependent. Tribunal consensus is LLM-based and prompt-sensitive.

5 Extracted Claims

Claim	Verified	Confidence
GW241011 and GW241110 are binary black hole coalescences observed during the fourth observing run of the LIGO–Virgo–KA	✓	0.34
The sources of GW241011 and GW241110 have rapid and precisely measured primary spins	✓	0.22
The sources of GW241011 and GW241110 have non-negligible spin–orbit misalignment	✓	0.23
The sources of GW241011 and GW241110 have unequal mass ratios between their constituent black holes	✓	0.28
GW241011 is the third loudest gravitational-wave event published to date	✓	0.24
GW241011 has a median network signal-to-noise ratio of 36.0	✓	0.22
The source of GW241011 and GW241110 can yield stringent constraints on the Kerr nature of black holes	✓	0.22
The source of GW241011 and GW241110 can yield constraints on the multipolar structure of gravitational-wave generation	✓	0.20
The sources of GW241011 and GW241110 suggest formation in dense stellar environments in which repeated mergers can take	✓	0.24

References

- http://arxiv.org/abs/2603.25938v1
- http://arxiv.org/abs/1411.4413v2

- http://arxiv.org/abs/2510.26931v1