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Anställning

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Forskningsoutput

Signatures of the speed of sound on the gravitational wave power spectrum from sound waves

Giombi, L., Dahl, J. & Hindmarsh, M., jan. 2025, I: Journal of Cosmology and Astroparticle Physics. 2025, 1, 35 s., 100.

Revised bounds on local cosmic strings from NANOGrav observations

Kume, J. & Hindmarsh, M., 3 dec. 2024, I: Journal of Cosmology and Astroparticle Physics. 2024, 12, 23 s., 001.

Primordial acoustic turbulence: Three-dimensional simulations and gravitational wave predictions

Dahl, J., Hindmarsh, M., Rummukainen, K. & Weir, D. J., 12 nov. 2024, I: Physical Review D. 110, 10, 32 s., 103512.

A-B Transition in Superfluid ^3He and Cosmological Phase Transitions

Hindmarsh, M., Sauls, J. A., Zhang, K., Autti, S., Haley, R. P., Heikkinen, P. J., Huber, S. J., Levitin, L. V., Lopez-Eiguren, A., Mayer, A. J., Rummukainen, K., Saunders, J. & Zmeev, D., 8 juni 2024, I: Journal of Low Temperature Physics. 215, 5-6, s. 495-524 30 s.

Nanofluidic Platform for Studying the First-Order Phase Transitions in Superfluid Helium-3

Heikkinen, P. J., Eng, N., Levitin, L. V., Rojas, X., Singh, A., Autti, S., Haley, R. P., Hindmarsh, M., Zmeev, D. E., Parpia, J. M., Casey, A. & Saunders, J., juni 2024, I: Journal of Low Temperature Physics. 215, 5-6, s. 477–494 18 s.

General relativistic bubble growth in cosmological phase transitions

Giombi, L. & Hindmarsh, M., mars 2024, I: Journal of Cosmology and Astroparticle Physics. 2024, 3, 46 s., 059.

Shallow relic gravitational wave spectrum with acoustic peak

Sharma, R., Dahl, J., Brandenburg, A. & Hindmarsh, M., 22 dec. 2023, I: Journal of Cosmology and Astroparticle Physics. 2023, 12, 23 s., 042.

Cosmology with the Laser Interferometer Space Antenna

The LISA Cosmology Working Group, Auclair, P., Bacon, D., Cutting, D., Hindmarsh, M., Hooper, D. C., Rummukainen, K. & Weir, D. J., 28 aug. 2023, I: Living reviews in relativity. 26, 1, 254 s., 5.

Multi-messenger constraints on Abelian-Higgs cosmic string networks

Hindmarsh, M. & Kume, J., apr. 2023, I: Journal of Cosmology and Astroparticle Physics. 2023, 4, 22 s., 045.

Reconstructing physical parameters from template gravitational wave spectra at LISA: first order phase transitions

Gowling, C., Hindmarsh, M., Hooper, D. C. & Torrado, J., apr. 2023, I: Journal of Cosmology and Astroparticle Physics. 2023, 4, 25 s., 061.

Prospects for LISA to detect a gravitational-wave background from first order phase transitions

Boileau, G., Christensen, N., Gowling, C., Hindmarsh, M. & Meyer, R., feb. 2023, I: Journal of Cosmology and Astroparticle Physics. 2023, 2, 24 s., 056.

Supercooling of the A phase of ^3He

Tian, Y., Lotnyk, D., Eyal, A., Zhang, K., Zhelev, N., Abhilash, T. S., Chavez, A., Smith, E. N., Hindmarsh, M., Saunders, J., Mueller, E. & Parpia, J. M., 10 jan. 2023, I: Nature Communications. 14, 1, 9 s., 148.

Decay of acoustic turbulence in two dimensions and implications for cosmological gravitational waves

Dahl, J. I., Hindmarsh, M., Rummukainen, K. & Weir, D., 12 sep. 2022, I: Physical Review D. 106, 6, 22 s., 063511.

Generation of gravitational waves from freely decaying turbulence

Auclair, P., Caprini, C., Cutting, D., Hindmarsh, M., Rummukainen, K., Steer, D. A. & Weir, D. J., sep. 2022, I: Journal of Cosmology and Astroparticle Physics. 9, 62 s., 029.

Thermal suppression of bubble nucleation at first-order phase transitions in the early Universe

Al Ajmi, M. & Hindmarsh, M., 11 juli 2022, I: Physical Review D. 106, 2, 12 s., 023505.

Gravitational Waves at Strong Coupling from an Effective Action

Ares, F. R., Henriksson, O., Hindmarsh, M., Hoyos, C. & Jokela, N., 1 apr. 2022, I: Physical Review Letters. 128, 13, 7 s., 131101.

Effective actions and bubble nucleation from holography

Ares, F. R., Henriksson, O., Hindmarsh, M., Hoyos, C. & Jokela, N., 29 mars 2022, I: Physical Review D. 105, 6, 21 s., 066020.

Challenges and opportunities of gravitational-wave searches at MHz to GHz frequencies

Aggarwal, N., Aguiar, O. D., Bauswein, A., Cella, G., Clesse, S., Cruise, A. M., Domcke, V., Figueroa, D. G., Geraci, A., Goryachev, M., Grote, H., Hindmarsh, M., Muia, F., Mukund, N., Ottaway, D., Peloso, M., Quevedo, F., Ricciardone, A., Steinlechner, J. & Steinlechner, S. och 5 andra, Sun, S., Tobar, M. E., Torrenti, F., Ünal, C. & White, G., 6 dec. 2021, I: Living reviews in relativity. 24, 1, 74 s., 4.

Observational prospects for phase transitions at LISA: Fisher matrix analysis

Gowling, C. & Hindmarsh, M., okt. 2021, I: Journal of Cosmology and Astroparticle Physics. 10, 35 s., 039.

Loop decay in Abelian-Higgs string networks

Hindmarsh, M., Lizarraga, J., Uriel, A. & Urrestilla, J., 16 aug. 2021, I: Physical Review D. 104, 4, 16 s., 043519.

Approach to scaling in axion string networks

Hindmarsh, M., Lizarraga, J., Lopez-Eiguren, A. & Urrestilla, J., 26 maj 2021, I: Physical Review D. 103, 10, 15 s., 103534.

Gravitational waves from a holographic phase transition

Ares, F. R., Hindmarsh, M., Hoyos, C. & Jokela, N., 12 apr. 2021, I: Journal of High Energy Physics. 4, 35 s., 100.

Gravitational waves from vacuum first-order phase transitions. II. From thin to thick walls

Cutting, D., Granados Escartin, E. S., Hindmarsh, M. & Weir, D., 25 jan. 2021, I: Physical Review D. 103, 2, 23 s., 023531.

Phase transitions in the early universe

Hindmarsh, M., Lüben, M., Lumma, J. & Pauly, M., 2021, I: SciPost physics lecture notes. 24, 61 s.

Irreducible background of gravitational waves from a cosmic defect network: Update and comparison of numerical techniques

Figueroa, D. G., Hindmarsh, M., Lizarraga, J. & Urrestilla, J., 13 nov. 2020, I: Physical Review D. 102, 10, 25 s., 103516.

Vorticity, Kinetic Energy, and Suppressed Gravitational-Wave Production in Strong First-Order Phase Transitions

Cutting, D., Hindmarsh, M. & Weir, D. J., 10 juli 2020, I: Physical Review Letters. 125, 2, 6 s., 021302.

Detecting gravitational waves from cosmological phase transitions with LISA: an update

LISA Cosmology Working Grp, Caprini, C., Chala, M., Dorsch, G. C., Hindmarsh, M., Huber, S. J., Konstandin, T., Kozaczuk, J., Nardini, G., No, J. M., Rummukainen, K., Schwaller, P., Servant, G., Tranberg, A. & Weir, D. J., mars 2020, I: Journal of Cosmology and Astroparticle Physics. 3, 60 s., 024.

Scaling Density of Axion Strings

Hindmarsh, M., Lizarraga, J., Lopez-Eiguren, A. & Urrestilla, J., 16 jan. 2020, I: Physical Review Letters. 124, 2, 6 s., 021301.

Gravitational waves from first order cosmological phase transitions in the Sound Shell Model

Hindmarsh, M. & Hijazi, M., dec. 2019, I: Journal of Cosmology and Astroparticle Physics. 12, 44 s., 062.

Type I Abelian Higgs strings: Evolution and cosmic microwave background constraints

Hindmarsh, M., Lizarraga, J., Urrestilla, J., Daverio, D. & Kunz, M., 26 apr. 2019, I: Physical Review D. 99, 8, 12 s., 083522.

Scaling in necklaces of monopoles and semipoles

Hindmarsh, M., Kormu, A., Lopez-Eiguren, A. & Weir, D. J., 29 nov. 2018, I: Physical Review D. 98, 10, 12 s., 103533.

Premordial black holes with an accurate QCD equation of state

Byrnes, C. T., Hindmarsh, M., Young, S. & Hawkins, M. R. S., aug. 2018, I: Journal of Cosmology and Astroparticle Physics. 2018, 8, 22 s., 041.

Gravitational waves from vacuum first-order phase transitions: From the envelope to the lattice

Cutting, D., Hindmarsh, M. & Weir, D. J., 12 juni 2018, I: Physical Review D. 97, 12, 15 s., 123513.

Exploring cosmic origins with CORE: Inflation

CORE Collaboration, Finelli, F., Hindmarsh, M., Kiiveri, K., Väliviita, J., Kurki-Suonio, H. & Lindholm, V., apr. 2018, I: Journal of Cosmology and Astroparticle Physics. 4, 106 s., 016.

Exploring cosmic origins with CORE: Survey requirements and mission design

CORE Collaboration, Delabrouille, J., Hindmarsh, M., Keihänen, E., Kiiveri, K., Kurki-Suonio, H., Lindholm, V. & Väliviita, J., apr. 2018, I: Journal of Cosmology and Astroparticle Physics. 4, 76 s., 014.

Sound Shell Model for Acoustic Gravitational Wave Production at a First-Order Phase Transition in the Early Universe
Hindmarsh, M., 13 feb. 2018, I: Physical Review Letters. 120, 7, 5 s., 071301.

Shape of the acoustic gravitational wave power spectrum from a first order phase transition
Hindmarsh, M., Huber, S. J., Rummukainen, K. & Weir, D. J., 16 nov. 2017, I: Physical Review D. 96, 10, 17 s., 103520.

Scaling from gauge and scalar radiation in Abelian-Higgs string networks
Hindmarsh, M., Lizarraga, J., Urrestilla, J., Daverio, D. & Kunz, M., 21 juli 2017, I: Physical Review D. 96, 2, 20 s., 023525.

Cosmic microwave background constraints for global strings and global monopoles
Lopez-Eiguren, A., Lizarraga, J., Hindmarsh, M. & Urrestilla, J., juli 2017, I: Journal of Cosmology and Astroparticle Physics. 2017, 07, 26 s., 026.

Numerical simulations of necklaces in SU(2) gauge-Higgs field theory
Hindmarsh, M., Rummukainen, K. & Weir, D. J., 24 mars 2017, I: Physical Review D. 95, 6, 14 s., 063520.

New Solutions for Non-Abelian Cosmic Strings
Hindmarsh, M., Rummukainen, K. & Weir, D. J., 14 dec. 2016, I: Physical Review Letters. 117, 25, 5 s., 251601.

New CMB constraints for Abelian Higgs cosmic strings
Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M. & Kunz, M., dec. 2016, I: Journal of Cosmology and Astroparticle Physics. 2016, 10, 15 s., 042.

Breaking symmetry, breaking ground
Hindmarsh, M., okt. 2016, I: Journal of Physics A: Mathematical and Theoretical. 49, 41, 3 s., 411001.

Energy-momentum correlations for Abelian Higgs cosmic strings
Daverio, D., Hindmarsh, M., Kunz, M., Lizarraga, J. & Urrestilla, J., 12 apr. 2016, I: Physical Review D. 93, 8, 22 s., 085014.

Science with the space-based interferometer eLISA. II: gravitational waves from cosmological phase transitions
Caprini, C., Hindmarsh, M., Huber, S., Konstandin, T., Kozaczuk, J., Nardini, G., No, J. M., Petiteau, A., Schwaller, P., Servant, G. & Weir, D. J., apr. 2016, I: Journal of Cosmology and Astroparticle Physics. 2016, 04, 35 s., 001.

Numerical simulations of acoustically generated gravitational waves at a first order phase transition
Hindmarsh, M., Huber, S. J., Rummukainen, K. & Weir, D. J., 22 dec. 2015, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 92, 12, 22 s., 123009.

The bispectrum of cosmic string temperature fluctuations including recombination effects
Regan, D. & Hindmarsh, M., okt. 2015, I: Journal of Cosmology and Astroparticle Physics. 10, 23 s., 030.

Dark matter with topological defects in the Inert Doublet Model
Hindmarsh, M., Kirk, R., No, J. M. & West, S. M., maj 2015, I: Journal of Cosmology and Astroparticle Physics. 2015, 5, 25 s., 048.

The bispectrum of matter perturbations from cosmic strings
Regan, D. & Hindmarsh, M., mars 2015, I: Journal of Cosmology and Astroparticle Physics. 3, 28 s., 008.

Big-bang nucleosynthesis and gamma-ray constraints on cosmic strings with a large Higgs condensate
Mota, H. F. S. & Hindmarsh, M., 2 feb. 2015, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 91, 4, 13 s., 043001.

Fitting BICEP2 with defects, primordial gravitational waves and dust

Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M., Kunz, M. & Liddle, A. R., 2015, I: Journal of Physics : Conference Series. 600, 6 s., 012025.

Gravitational waves from cosmological first order phase transitions

Hindmarsh, M., Huber, S., Rummukainen, K. & Weir, D., 2015, I: PoS Proceedings of Science. LATTICE 2015, 7 s., 233.

Constraining topological defects with temperature and polarization anisotropies

Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M., Kunz, M. & Liddle, A. R., 3 nov. 2014, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 90, 10, 9 s., 103504.

Improving cosmic string network simulations

Hindmarsh, M., Rummukainen, K., Tenkanen, T. V. I. & Weir, D. J., 29 aug. 2014, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 90, 4, 14 s., 043539.

Can Topological Defects Mimic the BICEP2 B-Mode Signal?

Lizarraga, J., Urrestilla, J., Daverio, D., Hindmarsh, M., Kunz, M. & Liddle, A. R., 29 apr. 2014, I: Physical Review Letters. 112, 17, 3 s., 171301.

Dark matter from decaying topological defects

Hindmarsh, M., Kirk, R. & West, S. M., mars 2014, I: Journal of Cosmology and Astroparticle Physics. 3, 21 s., 037.

Gravitational Waves from the Sound of a First Order Phase Transition

Hindmarsh, M., Huber, S. J., Rummukainen, K. & Weir, D. J., 27 jan. 2014, I: Physical Review Letters. 112, 4, 5 s., 041301.

Strictly anomaly mediated supersymmetry breaking

Hindmarsh, M. & Jones, D. R. T., 23 apr. 2013, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 87, 7, s. 075022 18 s.

Exact Scale-Invariant Background of Gravitational Waves from Cosmic Defects

Figueroa, D. G., Hindmarsh, M. & Urrestilla, J., 6 mars 2013, I: Physical Review Letters. 110, 10, s. 101302 5 s.

Consistent cosmology with Higgs thermal inflation in a minimal extension of the MSSM

Hindmarsh, M. & Jones, D. R. T., mars 2013, I: Journal of Cosmology and Astroparticle Physics. 2013, 3, s. 021 29 s.

f(R) gravity from the renormalization group

Hindmarsh, M. & Saltas, I. D., 17 sep. 2012, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 86, 6, s. 064029 16 s.

Radiation and relaxation of oscillons

Salmi, P. & Hindmarsh, M., 30 apr. 2012, I: Physical Review D : Particles, Fields, Gravitation and Cosmology. 85, 8, 16 s., 085033.

Projekt

Searching for early universe phase transitions with gravitational waves

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Searching for Phase Transitions in the Early Universe

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