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Josephson supercurrents in the Dirac semimetal Cd_3As_2

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Outline

- Cd_3As_2 Characterization
- Induced superconductivity in Cd_3As_2
- Summary

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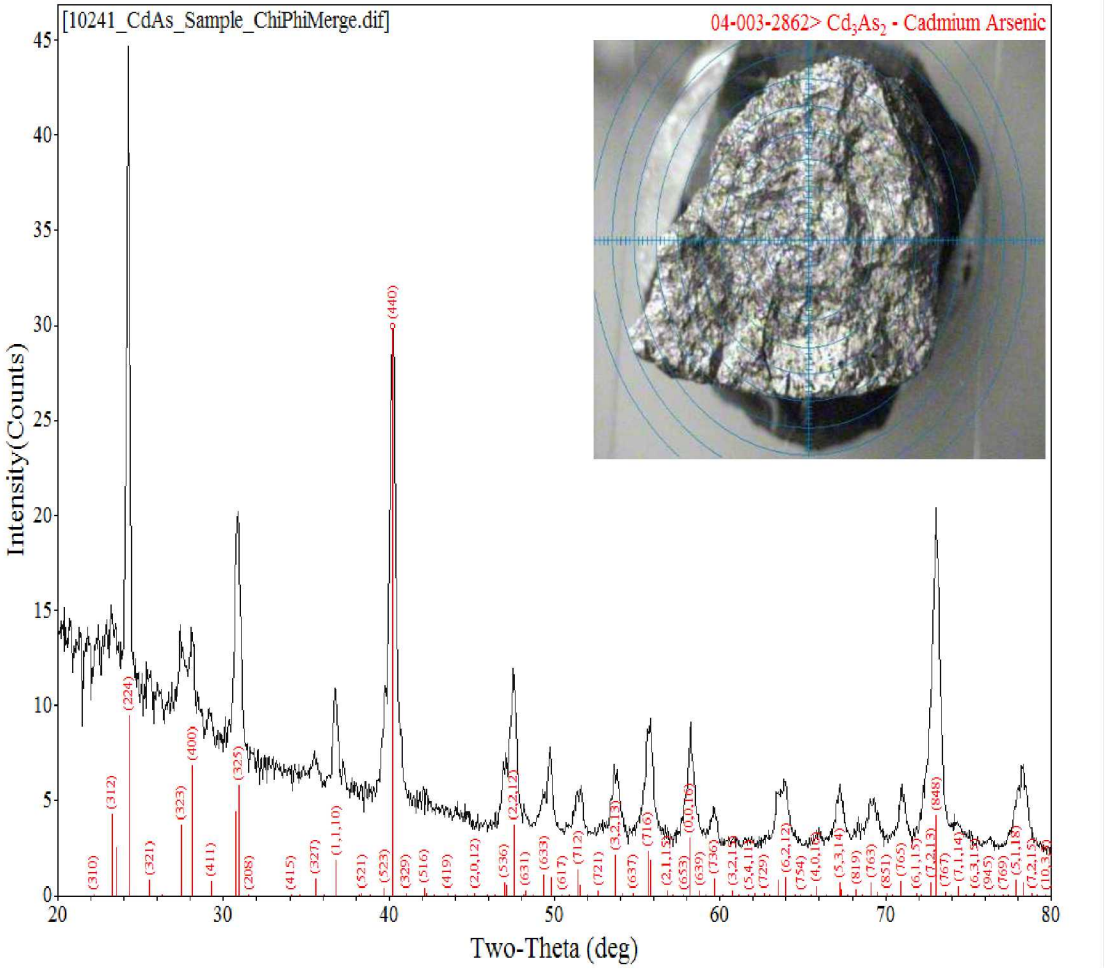
X-ray Diffraction



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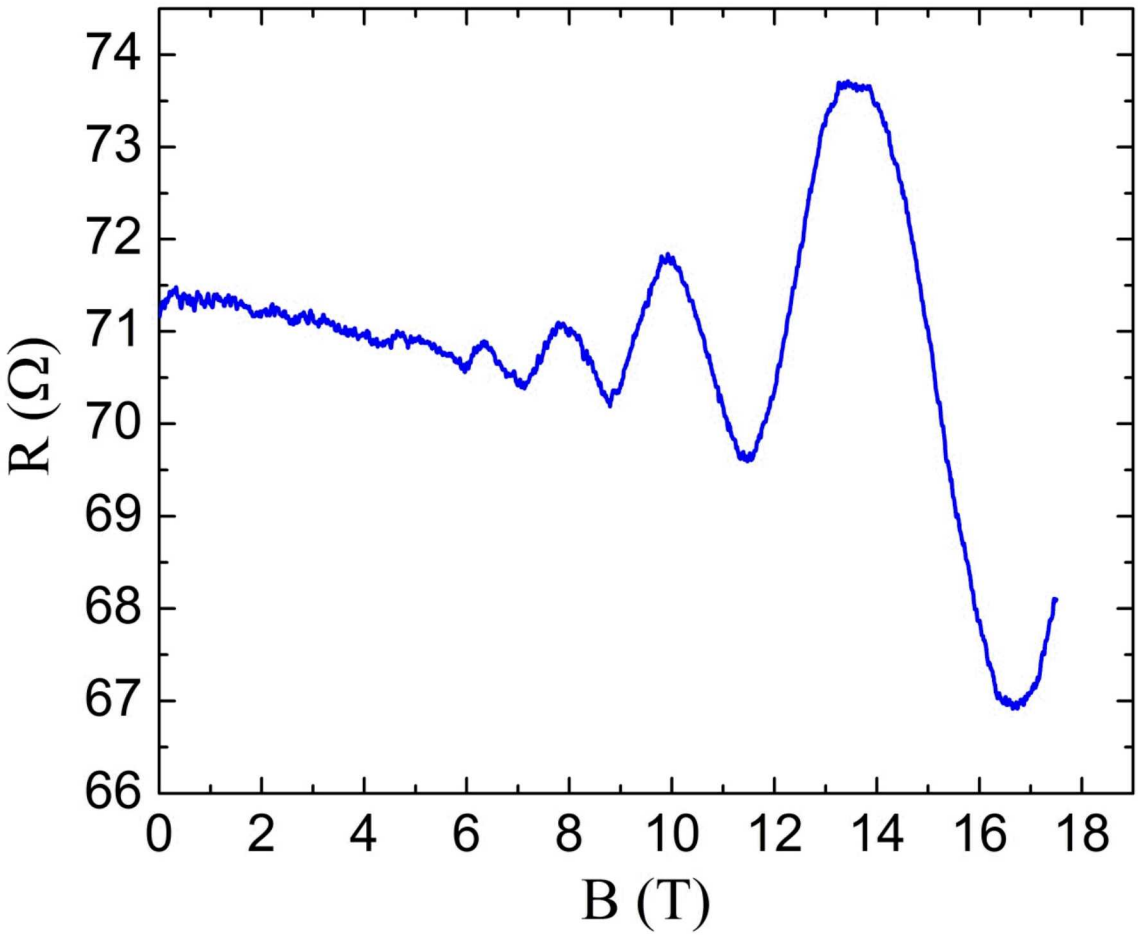
Quantum Oscillations



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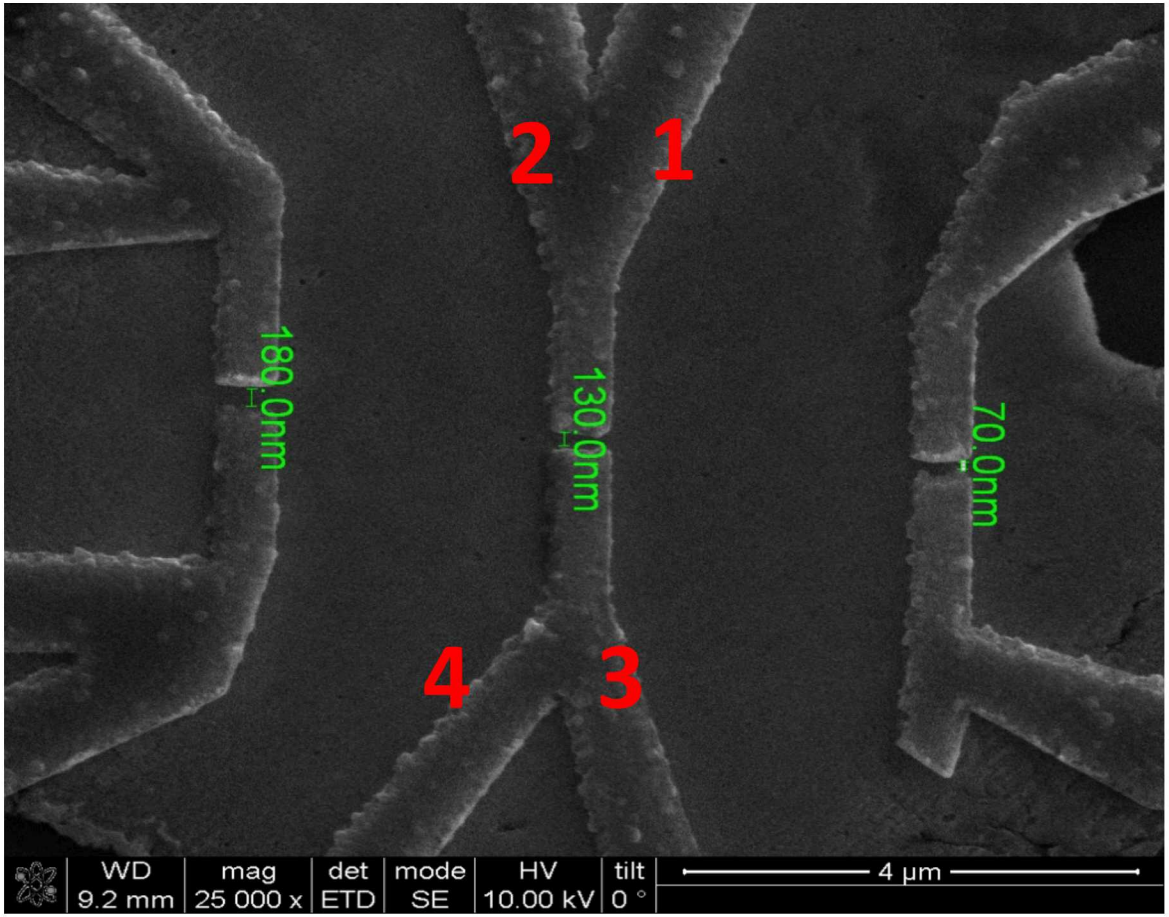
Al-Cd_3As_2-Al



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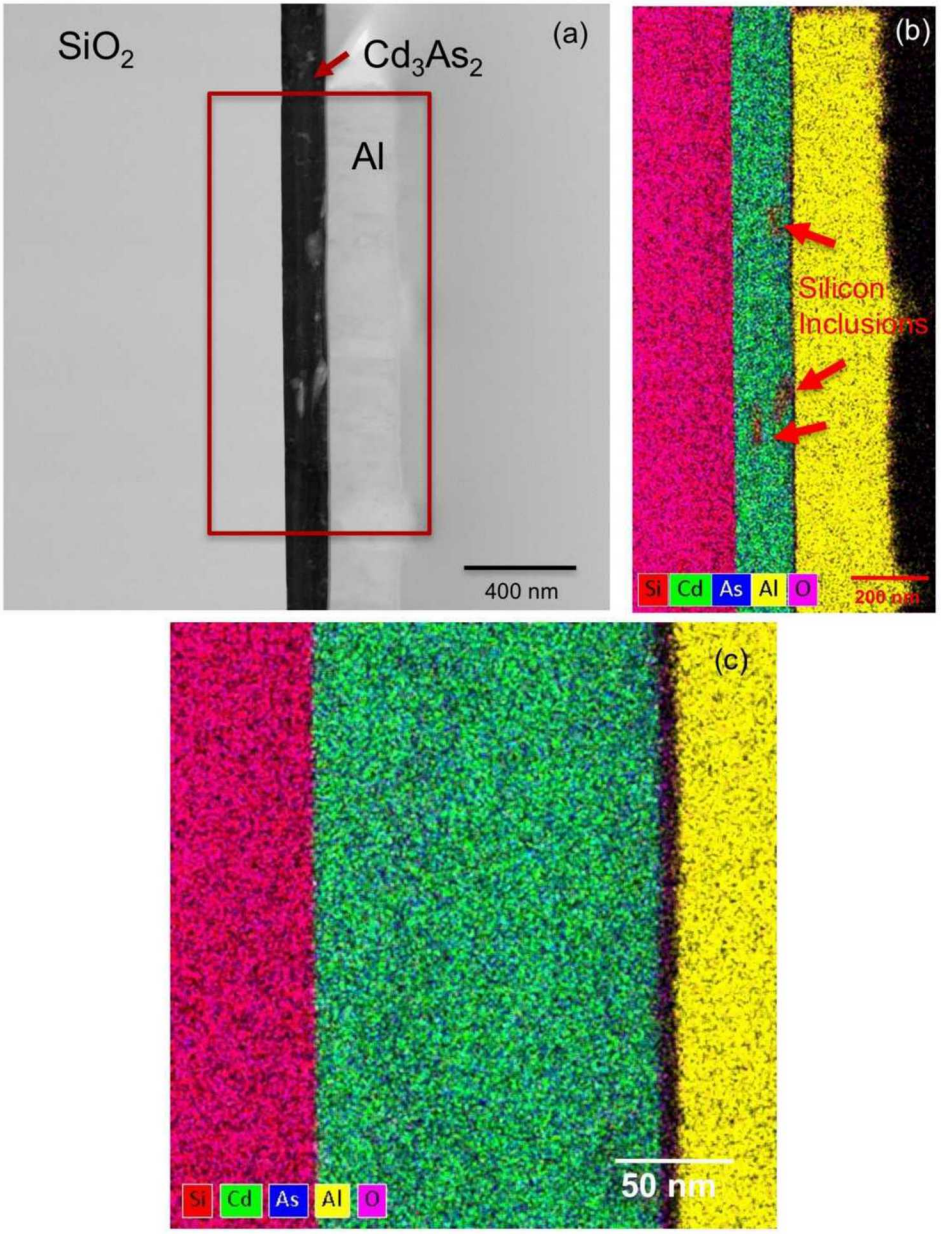
STEM Results



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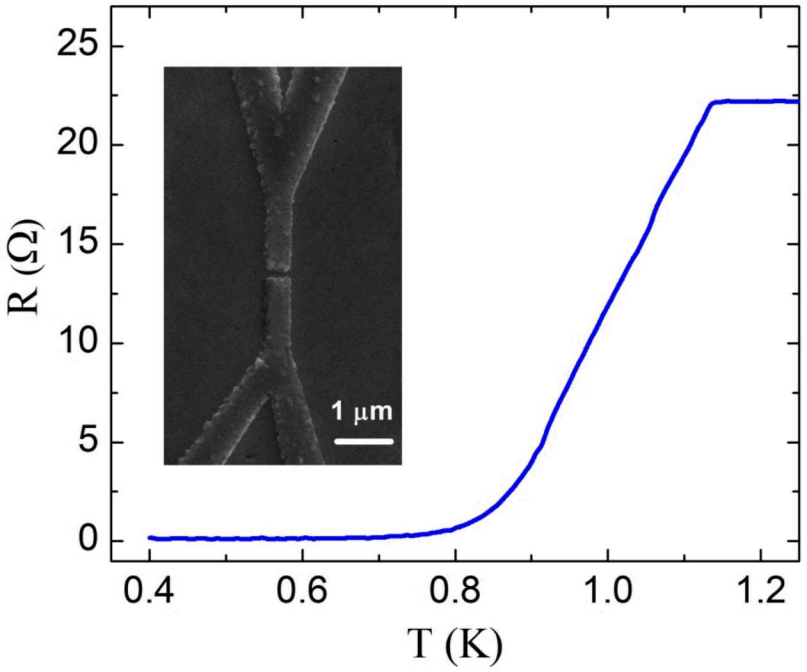
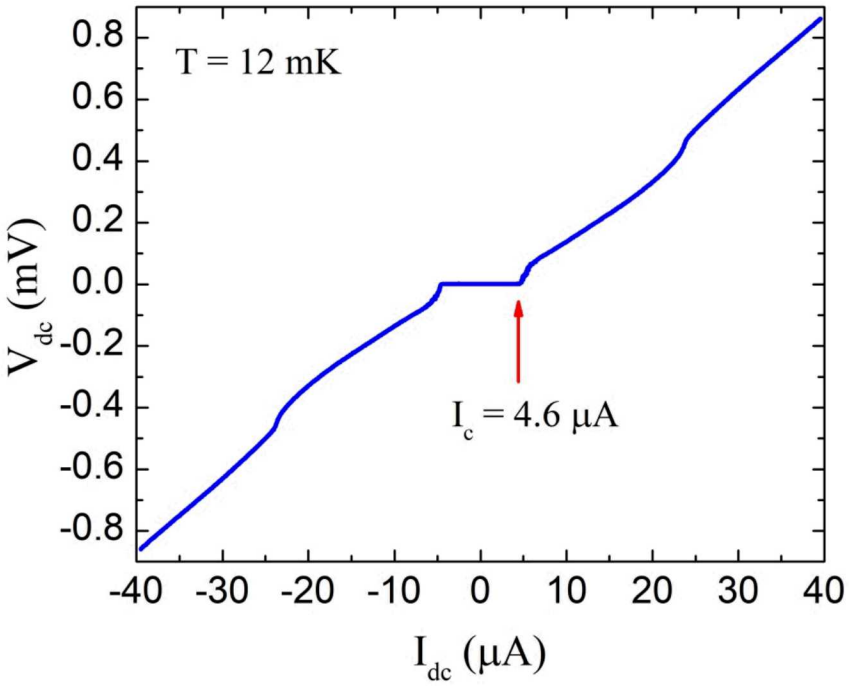
Superconductivity





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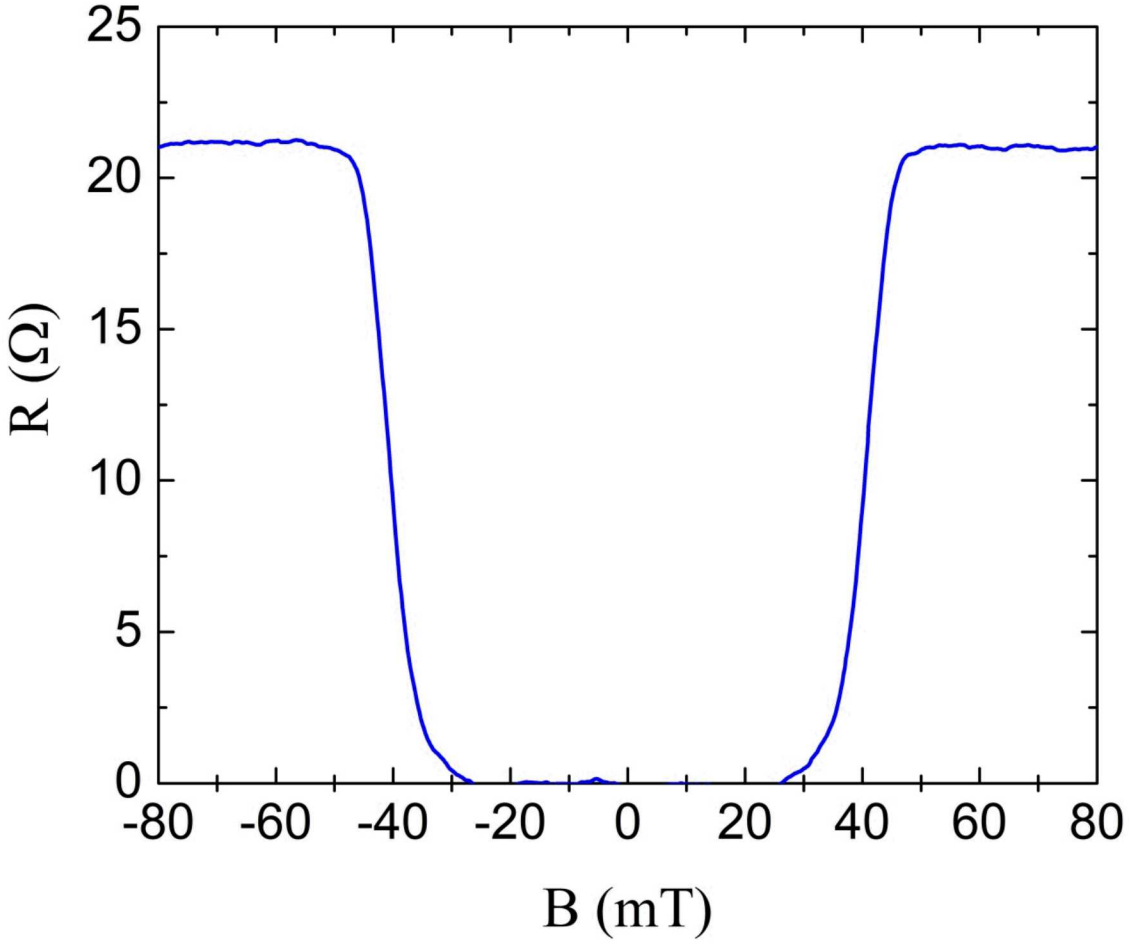
Field Dependence



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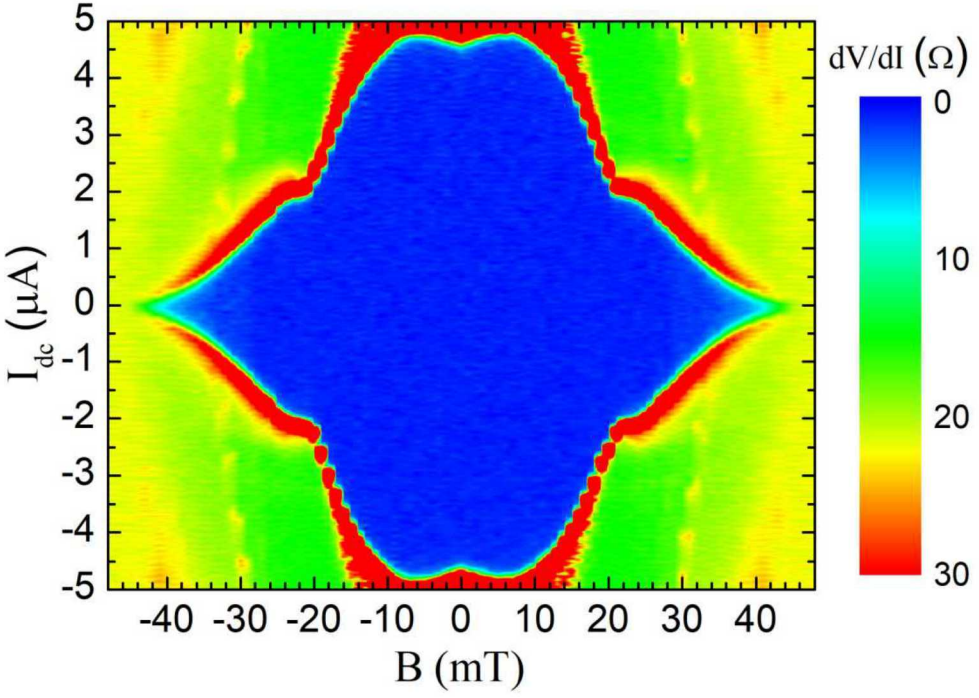
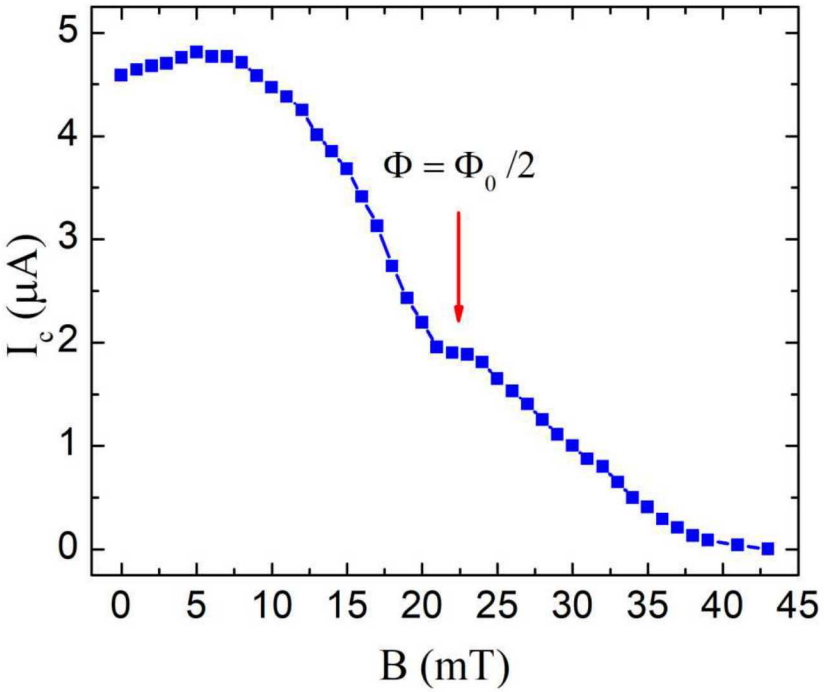
π Periodic Supercurrent





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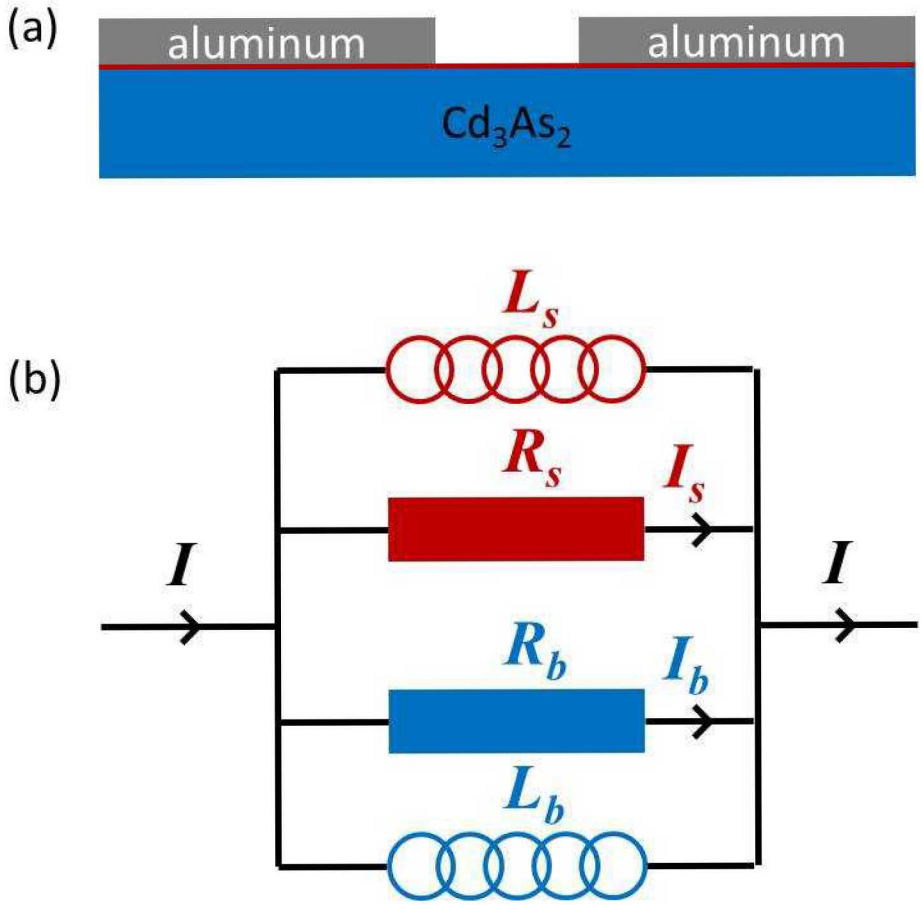
Theoretical Model



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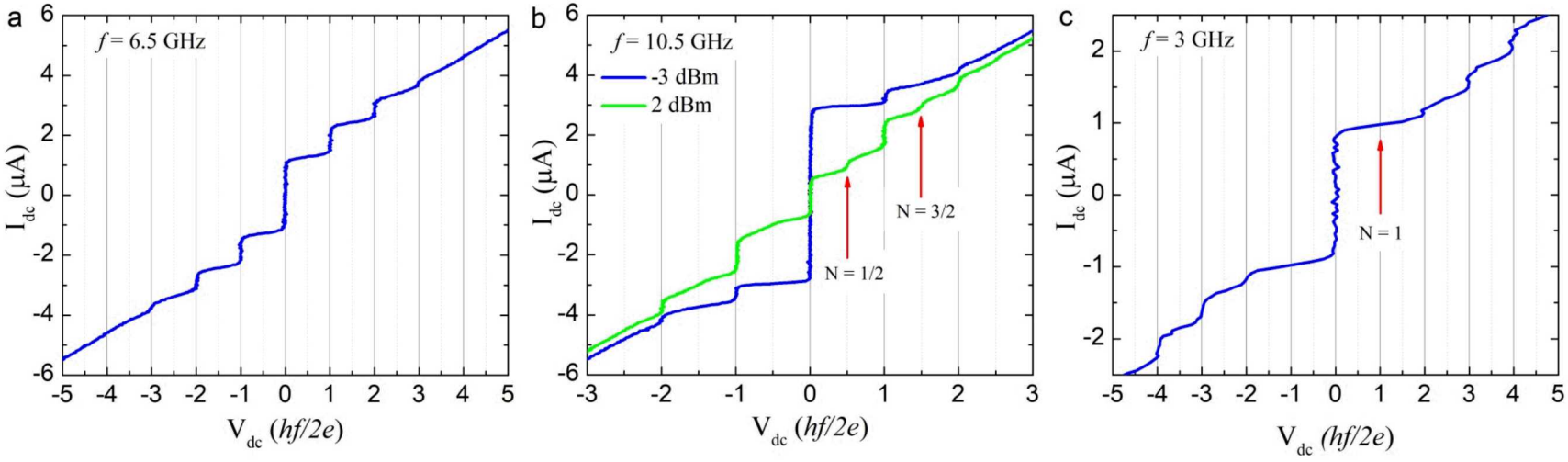
a.c. Josephson Effect



Summary

- Josephson supercurrent in Cd_3As_2
- I_c enhancement by the magnetic field
- Observed π and 4π periodic supercurrents

"π and 4π Josephson Effects Mediated by a Dirac Semimetal", arXiv:1801.04365

Thanks!