



Silicon-Germanium Heterostructures With Quantum Wells Having Oscillatory Germanium Concentration Profiles For Increased Valley Splitting

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The Invention

Semiconductor heterostructures, methods of making the heterostructures, and quantum dots and quantum computation devices based on the heterostructures are provided. The heterostructures include a quantum well of strained silicon seeded with a relatively low concentration of germanium impurities disposed between two quantum barriers of germanium or a silicon-germanium alloy. The quantum wells are characterized in that the germanium concentration in the wells has an oscillating profile that increases the valley splitting in the conduction band of the silicon quantum well.

Additional Information

For More Information About the Inventors

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Publications

- [McJunkin, T., Harpt, B., Feng, Y. et al. SiGe quantum wells with oscillating Ge concentrations for quantum dot qubits. Nat Commun 13, 7777 \(2022\). <https://doi.org/10.1038/s41467-022-35510-z>](#)
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Tech Fields

- [Information Technology: Hardware](#)

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