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Topological Solitons between Two Magic Number In-clusters on a Si(100) Surface Break the Even/Odd Symmetry in the Self-Selection of Their Distance YUH-LIN WANG, M.Y. LAI, J.P. CHOU, C.M. WEI, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan, O.A. UTAS, N.V. DENISOV, V.G. KOTLYAR, D. GRUZNEV, A. MATETSKY, A.V. ZOTOV, A.A. SARANIN, Institute of Automation and Control Processes, Vladivostok, Russia — Depositing particles randomly on a 1D lattice is expected to result in an equal number of particle pairs separated by even or odd lattice units. Unexpectedly, the even-odd symmetry is broken in the self-selection of distances between indium magic-number clusters on a Si(100)-2x1 reconstructed surface. Cluster pairs separated by even units are less abundant because they are linked by silicon atomic chains carrying topological solitons, which induce local strain and create localized electronic states with higher energy. Our findings reveal a unique particle-particle interaction mediated by the presence or absence of topological solitons on alternate lattices.

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