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The phase diagram and particle-hole asymmetry of the reentrant integer quantum Hall states of the second Landau level A. KUMAR, M.J. MANFRA, Department of Physics, Purdue University, L.N. PFEIFFER, K. W. WEST, Princeton University, G.A. CSATHY, Department of Physics, Purdue University — The second Landau level of a two-dimensional electron gas reveals a rich set of competing ground states. Besides an increasing number of fractional quantum Hall states, there are also eight reentrant integer quantum Hall states observed. These reentrant integer states are currently not understood, although they are believed to be collective insulators akin to the field induced Wigner solid with one or more electrons per site. These states are strongly affected by tilt in magnetic field and carrier density but surprisingly there is very limited data on their temperature dependence. We present a detailed study of the melting of the reentrant integer quantum Hall states of the second Landau level from which we extract the phase diagram in the temperature versus filling factor plane. We find that the melting temperatures of the various reentrant integer states violate the particle-hole symmetry. We also report that as the temperature is lowered the magnetoresistance deviates from an activated dependence.

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