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Junctions of Three Quantum Wires of spin-1/2 Electron System CHANG-YU HOU, Department of physics, Boston University, CLAUDIO CHA-MON, Department of physics, Boston University, MASAKI OSHIKAWA, Department of Physics, Tokyo Institute of Technology, IAN AFFLECK, Dept. of Phys. and Astro., University of British Columbia — We study a junction of three interacting quantum wires which are joined by a ring enclosing a magnetic flux. The wires are modeled as single channel spin-1/2 Tomonaga-Luttinger Liquids (TLL). We study the problem by identifying the boundary conditions corresponding to the low energy fixed points through both Delay Evaluation Boundary Condition and Boundary Conformal Field Theory method. We obtain a rich phase diagram as the function of the TLL interacting parameter,  $g_c$  and  $g_s$ , including a chiral regime in which the asymmetric current flow is highly sensitive to the sign of the flux and a phase in which electron pair tunneling dominates.

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