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Construction of Field Algebras with Quantum Symmetry from Local Observables

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Abstract: It has been discussed earlier that (weak quasi-) quantum groups allow for a conventional interpretation as internal symmetries in local quantum theory. From general arguments and explicit examples their consistency with (braid-) statistics and locality was established. This work addresses the reconstruction of quantum symmetries and algebras of field operators. For every algebra $\mathscr{A}$ of observables satisfying certain standard assumptions, an appropriate quantum symmetry is found. Field operators are obtained which act on a positive definite Hilbert space of states and transform covariantly under the quantum symmetry. As a substitute for Bose/Fermi (anti-) commutation relations, these fields are demonstrated to obey a local braid relation.

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