1058-20-113 **Hendryk Pfeiffer*** (pfeiffer@math.ubc.ca), Department of Mathematics, The University of British Columbia, 121-1984 Mathematics Road, Vancouver, BC V6T 1Z2, Canada. *Fusion categories in terms of graphs and relations.*

Every fusion category $\mathcal{C}$ that is k-linear over a suitable field k, is the category of finite-dimensional comodules of a Weak Hopf Algebra H over k, the universal coend with respect to the long canonical functor $\omega\colon \mathcal{C} \to \mathbf{Vect}_k$. We show that H is a quotient $H = H[\mathcal{G}]/I$ of a Weak Bialgebra $H[\mathcal{G}]$ which has a combinatorial description in terms of a finite directed graph $\mathcal{G}$ that depends on the choice of a generator M of $\mathcal{C}$ and on the fusion coefficients of $\mathcal{C}$. The algebra underlying $H[\mathcal{G}]$ is the path algebra of the quiver $\mathcal{G} \times \mathcal{G}$, and so the composability of paths in $\mathcal{G}$ parameterizes the truncation of the tensor product of $\mathcal{C}$. The ideal I is generated by two types of relations. The first type enforces that the tensor powers of the generator M have the appropriate endomorphism algebras, thus providing a Schur–Weyl dual description of $\mathcal{C}$. If $\mathcal{C}$ is braided, this includes relations of the form '$RTT = TTR$' where R contains the coefficients of the braiding on $\omega M \otimes \omega M$. The second type of relations removes a suitable set of group-like elements. (Received February 09, 2010)