A Universal Asymptotic Formula
for OPE Coefficients

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Two dimensional conformal field theories are among the most important quantum field
theories: they describe important statistical and condensed matter systems near critical-
ity, and – while not exactly solvable – many exact techniques can be used which are not
available in higher dimensions. For example, Cardy used modular invariance to derive
a universal asymptotic formula for the high energy density of states. I will describe an
analogous universal asymptotic formula for the operator product expansion coefficients
of any two dimensional CFT. This formula unifies all previous asymptotic formulas for
CFT structure constants, including those derived from crossing symmetry of four point
functions, modular covariance of one-point functions and higher genus modular invari-
ance. Moreover, this formula is valid at finite central charge, whereas previous results
were derived only in the large central charge limit. The crucial ingredient in the deriva-
tion is Teschner’s crossing kernel, which gives analytic control over the structure constants
even though the conformal blocks are only known perturbatively. We will describe appli-
cations to holographic theories as well as the relationship with eigenstate thermalization
and chaos.

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