

# Large parameter limits of conformal blocks

Connor Behan

*Department of Physics and Astronomy, University of British Columbia, 6224  
Agricultural Road Vancouver BC*

## Abstract

A surprising fact is that conformally invariant quantum field theories can be “bootstrapped”. This is because they can be defined without reference to a Lagrangian or Hamiltonian. All one needs are the spins and scaling dimensions of the local operators and the three-point function coefficients. Some choices for these numbers correspond to the critical Ising model or the supersymmetric Yang Mills model, but most are unphysical and must be ruled out numerically. I will present new results about conformal blocks - a family of functions that are important in these numerical studies. One result is that the blocks approach monomials as the dimension difference between two operators becomes large. Another is that they lose dependence on dimension differences as the spacetime dimension becomes large. Most progress with the conformal bootstrap has been made by studying the correlation functions of scalar operators. Studies of higher spin operators are expected to lead to a wealth of information particularly in the non-supersymmetric case. The analogous functions that would be needed, called spinning conformal blocks, are much further from being well understood. I will touch on large parameter limits of these functions as well and what they can tell us about the road ahead.