Title: Colliders and conformal interfaces
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Collection: Boundaries and Defects in Quantum Field Theory
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Abstract: We probe a generic two dimensional conformal interface via a collider experiment. We measure the energy and charges which are reflected and transmitted through the interface. If the largest symmetry algebra is Virasoro, the average transmitted energy is independent of the details of the initial state, and is fixed in terms of the central charges and of the two-point function of the displacement operator. The situation is more elaborate when extended symmetries are present. We comment on the bounds imposed by positivity of the total energy flux at infinity, and on applications of the result to the physics of steady states.
Colliders & conformal interfaces

w/ J. Penedones, A. Rousset

1. Setup
2. R & P
3. Transparency and displacement
4. Outlook

CFT_L  |  CFT_R
Colliders & conformal interfaces

w/ J. Penedones, A. Rousset

1. 
2. 
3. 
4.
1. Setup

\[ <T_{\infty}> = <T(2)> + <T(2)> \]

\[ r = \frac{T - x}{2} \]

\[ \frac{\partial}{\partial x} \]

\[ x = -\infty \quad x = \infty \]
2. Reflection & Transmission

\[ R = \frac{\text{reflected}}{\text{incident}} \]
If largest sym algebra is \( \mathcal{V} \), then

\[
\frac{C_{R^2}}{1 - \frac{Z}{Z_1}} \quad \frac{C_{R^2}}{C_{R^2}}
\]
interfaces
s, A Rousset
\[ \frac{\mathbf{Q}(x, \tilde{x}) \mathbf{Tr}(x \mathbf{C}(\tilde{x}, z))}{\sum} = f(\tilde{x}, u) \]

No int \[ f = h \]

\[ \frac{D}{\underline{D}} \]

\[ u \, \rightarrow \, z \]

\[ E = -\frac{1}{\epsilon} \int_{\mathcal{D}} \phi \, \eta \, dS \]

\[ 1_{\mathcal{E}, D} \]

\[ R_l = \lim_{D \to \infty} \]

\[ < \mathcal{E}, D > \]

\[ \mathcal{L}_l \]
\[ \mathcal{C}_L \times \mathcal{C}_R \rightarrow \mathcal{C}_{\text{ch}} \]

\[ \{ \begin{cases} \text{lowest twist } \mathcal{C}_{\text{ch}} \text{ ops surviving } \quad \overline{h} = 0 \\ \langle \mathcal{C}_{\text{ch}} \quad \overline{\mathcal{T}_R} \rangle \propto \delta_{h - \overline{h}, 2} \end{cases} \}

\text{Only } (2,0) \text{ contribute}

\[ \overline{L} \rightarrow \overline{T}_L \]

\[ f(0, w) = \text{const} \text{ in } \mathcal{O}_2 \]
Checks

Extended symmetries

\((q_1, q_2) = (q_0)\)

"coset stress-tensors"

Quelle, Runkel, Watts
- Checks
- Extended symmetries
  \( (h, h^*) = (2, 0) \)
  "coset stress-tensors"
- Quelle, Runkel, Watts

**Outlook**

- WIP w/ L. Bianchi