

Loop Series in Attractive Models

$$Z(q) = 1 + \sum_{\emptyset \neq F \subseteq E} \beta_F \prod_{s \in V} \mathbb{E}_{q_s} \left[(X_s - \tau_s)^{d_s(F)} \right]$$

$$\beta_F = \prod_{(s,t) \in F} \beta_{st} \quad \beta_{st} = \frac{\text{Cov}_{q_{st}}(X_s, X_t)}{\text{Var}_{q_s}(X_s) \text{Var}_{q_t}(X_t)} \geq 0$$

- When are binary pseudo-central moments non-negative?
- Bound holds when

$$\tau_s \leq \frac{1}{2} \quad \text{for all nodes } s \in V$$

OR

$$\tau_s \geq \frac{1}{2} \quad \text{for all nodes } s \in V$$

