

$$\begin{array}{c}
 \mu \text{---} \text{---} J_n^\mu \text{---} \text{---} i \\
 \text{---} \text{---} 1 \\
 \text{---} \text{---} \vdots \\
 \text{---} \text{---} n
 \end{array}
 = \sum_i \begin{array}{c}
 1 \\
 \text{---} \text{---} J \\
 \text{---} \text{---} \vdots \\
 \text{---} \text{---} i \\
 \text{---} \text{---} V_3 \text{---} \text{---} \\
 \text{---} \text{---} J \\
 \text{---} \text{---} \vdots \\
 \text{---} \text{---} i+1 \\
 \text{---} \text{---} n
 \end{array}
 + \sum_{i,j} \begin{array}{c}
 1 \\
 \text{---} \text{---} J \\
 \text{---} \text{---} \vdots \\
 \text{---} \text{---} i \\
 \text{---} \text{---} V_4 \text{---} \text{---} \\
 \text{---} \text{---} J \\
 \text{---} \text{---} \vdots \\
 \text{---} \text{---} j+1 \\
 \text{---} \text{---} J \\
 \text{---} \text{---} \vdots \\
 \text{---} \text{---} n
 \end{array}$$

Diagram illustrating the decomposition of a vertex J_n^μ into a sum of diagrams involving vertices J and internal lines.

The left side shows a vertex J_n^μ with an incoming line labeled μ and outgoing lines labeled $1, \dots, i, \dots, n$.

The right side shows the decomposition into two terms:

- A sum over i of a diagram where the vertex J_n^μ is replaced by a vertex J connected to a vertex V_3 (marked with a red dot). The vertex J has outgoing lines $1, \dots, i$. The vertex V_3 is connected to a vertex J which has outgoing lines $i+1, \dots, n$.
- A sum over i, j of a diagram where the vertex J_n^μ is replaced by a vertex J connected to a vertex V_4 (marked with a red dot). The vertex J has outgoing lines $1, \dots, i$. The vertex V_4 is connected to two vertices J , one with outgoing lines $i+1, \dots, j$ and the other with outgoing lines $j+1, \dots, n$.