

$$\eta /: \eta[i_]^2 = 0; \quad \eta /: \eta[i_]\eta[j_] = 0;$$

$$\text{FTG}_{i_,j_}[\mathcal{E}_] := \text{Expand}[\mathcal{E} /. \{$$
$$\mathbf{f}_. \cdot \mathbf{v}_{k_} \Rightarrow \text{Plus}[\mathbf{f} \mathbf{v}_k /. \mathbf{v}_j \rightarrow (1 - \mathbf{t}_i - \eta[i]) \mathbf{v}_i + (\mathbf{t}_i + \eta[i]) \mathbf{v}_j,$$
$$(\mathbf{t}_i \text{Coefficient}[\mathbf{f}, \eta[i]] - \mathbf{t}_j \text{Coefficient}[\mathbf{f}, \eta[j]])$$
$$(1 - \mathbf{t}_i^{-1}) (\mathbf{u}_k /. \mathbf{u}_j \rightarrow (1 - \mathbf{t}_i) \mathbf{u}_i + \mathbf{t}_i \mathbf{u}_j) \mathbf{u}_i \mathbf{w}_j,$$
$$\text{K}\delta_{k,i} (\mathbf{f} /. _ \eta \rightarrow 0) (\mathbf{u}_j - \mathbf{u}_i) \mathbf{u}_i \mathbf{w}_j],$$
$$\mathbf{u}_j \rightarrow (1 - \mathbf{t}_i) \mathbf{u}_i + \mathbf{t}_i \mathbf{u}_j,$$
$$\mathbf{w}_i \rightarrow \mathbf{w}_i + (1 - \mathbf{t}_i^{-1}) \mathbf{w}_j, \quad \mathbf{w}_j \rightarrow \mathbf{t}_i^{-1} \mathbf{w}_j \}];$$