

$$\begin{array}{c}
 \mathcal{B} \in \mathbb{R}^{4 \times 4 \times 4 \times 4} \\
 \begin{array}{cccc}
 \begin{array}{c} \text{4x4x4 cube} \\ \text{4x4x4 cube} \\ \text{4x4x4 cube} \\ \text{4x4x4 cube} \end{array} & & & \\
 [K, L, M, N]
 \end{array}
 \end{array}
 =
 \begin{array}{c}
 \begin{array}{cc}
 \begin{array}{c} \mathcal{A}_1 \\ [r_1, K, r_2] \end{array} \begin{array}{c} \text{4x4x2 cube} \\ \text{4x4x2 cube} \end{array} & \begin{array}{c} \mathcal{A}_2 \\ [r_2, L, r_3] \end{array} \begin{array}{c} \text{4x4x2 cube} \\ \text{4x4x2 cube} \end{array} \\
 \begin{array}{c} \mathcal{A}_4 \\ [r_4, N, r_1] \end{array} \begin{array}{c} \text{4x4x2 cube} \\ \text{4x4x2 cube} \end{array} & \begin{array}{c} \mathcal{A}_3 \\ [r_3, M, r_4] \end{array} \begin{array}{c} \text{4x4x2 cube} \\ \text{4x4x2 cube} \end{array}
 \end{array}
 \end{array}$$