

$$D_3^{\mathbb{R}} \times f_3^{\mathbb{R}} = \frac{D_3 \times f_3}{0} \left| \begin{array}{c} 0 \\ J_3 D_3 J_3 \times f_3^{\sim} \end{array} \right.$$

$$D_3 \times f_3 = \frac{\frac{df_{\mathbf{z}}}{0} \left| \begin{array}{c} 1 \\ 0 \end{array} \right| \frac{0}{1}}{0} \left| \begin{array}{c} 0 \\ \Gamma \underline{\tilde{\varepsilon}}^* F - \underline{\tilde{f}}_{\mathbf{z}}^* \frac{d}{0} \left| \begin{array}{c} * \\ 0 \end{array} \right| \frac{0}{\tilde{e}} \end{array} \right.$$

$$\frac{\underline{\varepsilon f} - F \underline{\varepsilon} \Gamma_{\mathbf{z}} \frac{d}{0} \left| \begin{array}{c} 0 \\ e \end{array} \right|}{\underline{\varepsilon \bar{f}} - F \underline{\varepsilon} \Gamma_{\mathbf{z}} \frac{u}{0}} \left| \begin{array}{c} 0 \\ dF_{\mathbf{z}} \frac{1}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right| \end{array} \right.$$

$$J_3 D_3 J_3 \times f_3^{\sim} = \frac{\frac{d\bar{f}_a \mathbf{z}}{0} \frac{\bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| + \frac{d\bar{f}_{\mathbf{z}}}{0} \frac{0}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right|}{0} \left| \begin{array}{c} 0 \\ d\bar{f}_a \mathbf{z} \bar{a} \end{array} \right.$$

$$\frac{0}{0} \left| \begin{array}{c} 0 \\ d\bar{f}_a \mathbf{z} \frac{\bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| + \frac{d\bar{f}_{\mathbf{z}}}{0} \frac{0}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right| \end{array} \right.$$

$$D_3 f_3 = \frac{\frac{\mathbf{r} f_{\mathbf{z}}}{0} \frac{1}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right|}{0} \left| \begin{array}{c} 0 \\ \Gamma \underline{\tilde{\varepsilon}}^* F_{\mathbf{z}} \frac{d}{0} \left| \begin{array}{c} * \\ 0 \end{array} \right| \frac{0}{\tilde{e}} \end{array} \right.$$

$$\frac{\varepsilon f \Gamma_{\mathbf{z}} \frac{d}{0} \left| \begin{array}{c} 0 \\ e \end{array} \right|}{\varepsilon \bar{f} \Gamma_{\mathbf{z}} \left[\begin{array}{c} u \\ 0 \end{array} \right]} \left| \begin{array}{c} 0 \\ \mathbf{r} F_{\mathbf{z}} \frac{1}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right| \end{array} \right.$$

$$f_3 D_3 = \frac{\frac{f \mathbf{r}}{0} \frac{1}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right|}{0} \left| \begin{array}{c} 0 \\ \Gamma f \underline{\tilde{\varepsilon}}^* \frac{d}{0} \left| \begin{array}{c} * \\ 0 \end{array} \right| \frac{0}{\tilde{e}} \end{array} \right.$$

$$\frac{F \varepsilon \Gamma_{\mathbf{z}} \frac{d}{0} \left| \begin{array}{c} 0 \\ e \end{array} \right|}{F \varepsilon \Gamma_{\mathbf{z}} \left[\begin{array}{c} u \\ 0 \end{array} \right]} \left| \begin{array}{c} 0 \\ \Gamma \bar{f} \underline{\tilde{\varepsilon}}^* \left[\begin{array}{c} \bar{u} \\ 0 \end{array} \right] \end{array} \right.$$

$$J_3 D_3 J_3 f_3^{\sim} = \frac{\frac{\mathbf{r} \bar{f}_a \mathbf{z} \frac{\bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| + \mathbf{r} \bar{f}_{\mathbf{z}} \frac{0}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right|}{0} \left| \begin{array}{c} 0 \\ -\Gamma \underline{\tilde{\varepsilon}}^* \bar{f}_a \mathbf{z} \frac{d^t \bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| - \Gamma \underline{\tilde{\varepsilon}}^* \bar{f}_{\mathbf{z}} \frac{0}{0} \left| \begin{array}{c} 0 \\ e^t \end{array} \right| \end{array} \right.$$

$$\frac{0}{0} \left| \begin{array}{c} 0 \\ \mathbf{r} \bar{f}_a \mathbf{z} \bar{a} \end{array} \right.$$

$$\frac{-\varepsilon \Gamma \bar{f}_a \mathbf{z} \frac{\bar{d} \bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| - \varepsilon \Gamma \bar{f}_{\mathbf{z}} \frac{0}{0} \left| \begin{array}{c} 0 \\ \bar{e} \end{array} \right|}{-\varepsilon \Gamma \bar{f}_a \mathbf{z} \left[\begin{array}{c} \bar{u} \bar{a} \\ 0 \end{array} \right]} \left| \begin{array}{c} 0 \\ \mathbf{r} \bar{f}_a \mathbf{z} \frac{\bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| + \mathbf{r} \bar{f}_{\mathbf{z}} \frac{0}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right| \end{array} \right.$$

$$\frac{\bar{f}_a \mathbf{r} \frac{\bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| + \bar{f}_{\mathbf{z}} \frac{0}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right|}{0} \left| \begin{array}{c} 0 \\ -\bar{f}_a \Gamma \underline{\tilde{\varepsilon}}^* \frac{\bar{a} d^t}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| - \bar{f}_{\mathbf{z}} \Gamma \underline{\tilde{\varepsilon}}^* \frac{0}{0} \left| \begin{array}{c} 0 \\ e^t \end{array} \right| \end{array} \right.$$

$$f_3^{\sim} J_3 D_3 J_3 = \frac{0}{0} \left| \begin{array}{c} 0 \\ \bar{f}_a \mathbf{r} \mathbf{z} \bar{a} \end{array} \right.$$

$$\frac{-\bar{f}_a \varepsilon \Gamma_{\mathbf{z}} \frac{\bar{a} \bar{d}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| - \bar{f}_{\mathbf{z}} \varepsilon \Gamma_{\mathbf{z}} \frac{0}{0} \left| \begin{array}{c} 0 \\ \bar{e} \end{array} \right|}{-\bar{f}_a \varepsilon \Gamma_{\mathbf{z}} \left[\begin{array}{c} \bar{a} \bar{u} \\ 0 \end{array} \right]} \left| \begin{array}{c} 0 \\ \bar{f}_a \mathbf{r} \mathbf{z} \frac{\bar{a}}{0} \left| \begin{array}{c} 0 \\ 0 \end{array} \right| + \bar{f}_{\mathbf{z}} \mathbf{r} \mathbf{z} \frac{0}{0} \left| \begin{array}{c} 0 \\ 1 \end{array} \right| \end{array} \right.$$