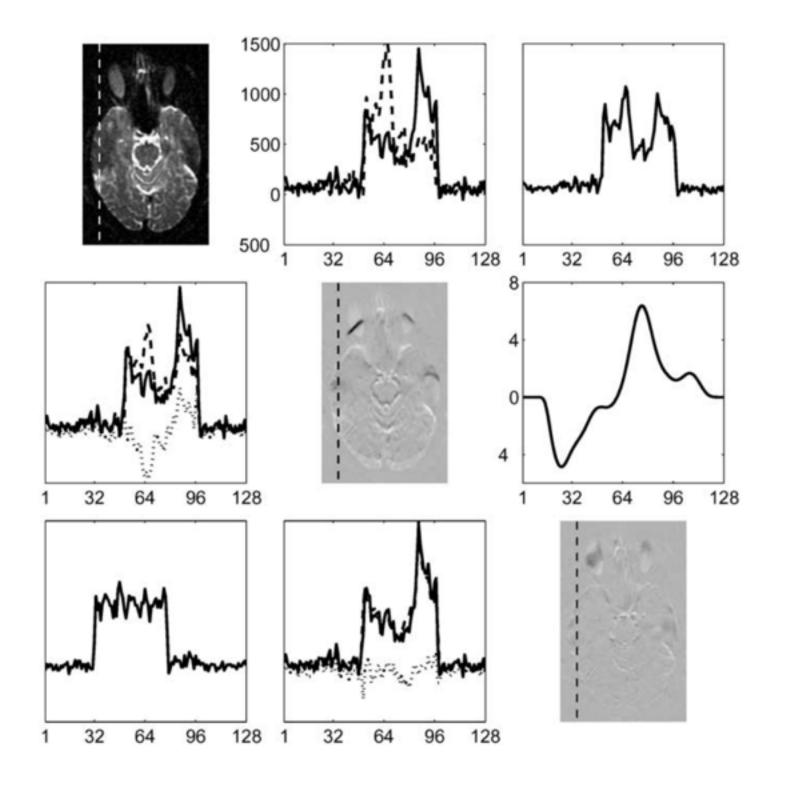
HAL FIIK XIIK-

$$\underbrace{\begin{bmatrix} \widehat{\mathbf{e}_{+}} \\ \widehat{\mathbf{e}_{+}} \end{bmatrix}}_{2n \times 1} = \underbrace{\mathbf{R}(\mathbf{b})}_{2n \times 2n} \underbrace{\begin{bmatrix} \mathbf{f}_{+} \\ \mathbf{f}_{-} \end{bmatrix}}_{2n \times 1}$$

$$\underbrace{\mathbf{R}(\mathbf{b})}_{2n\times 2n} = \underbrace{\mathbf{I}}_{2n\times 2n} - \underbrace{\begin{bmatrix} \mathbf{K}_{+}(\mathbf{b}) \\ \mathbf{K}_{-}(\mathbf{b}) \end{bmatrix}}_{2n\times 1}$$

$$\times \left(\underbrace{\begin{bmatrix} \mathbf{K}_{+}^{T}(\mathbf{b}) & \mathbf{K}_{-}^{T}(\mathbf{b}) \end{bmatrix} \begin{bmatrix} \mathbf{K}_{+}(\mathbf{b}) \\ \mathbf{K}_{-}(\mathbf{b}) \end{bmatrix}}^{-1} \right)$$

$$\times \underbrace{\left[\mathbf{K}_{+}^{T}(\mathbf{b}) \quad \mathbf{K}_{-}^{T}(\mathbf{b})\right]}_{n \times 2n}$$



$$\min_{\text{arg}=\mathbf{b}} O(\mathbf{b}) = \begin{pmatrix} \sum_{c=1}^{m} [\mathbf{f}_{c+}^{T} & \mathbf{f}_{c-}^{T}] \mathbf{R}_{c}(\mathbf{b}) \begin{bmatrix} \mathbf{f}_{c+} \\ \mathbf{f}_{c-} \end{bmatrix} \end{pmatrix}$$





- AGRAN MODULATION

$$f_{+}(\mathbf{x} - [\mathbf{0} \quad d(\mathbf{x}, \mathbf{b}) \quad 0]^{T}) \left(1 - \frac{\partial d}{\partial y} \Big|_{\mathbf{x}}\right)$$

$$\approx f_{-}(\mathbf{x} + [\mathbf{0} \quad d(\mathbf{x}, \mathbf{b}) \quad 0]^{T}) \left(1 + \frac{\partial d}{\partial y} \Big|_{\mathbf{x}}\right)$$

$$\sum_{\mathbf{x} \in V} \left(f_{+}(\mathbf{x} - [\mathbf{0} \quad d(\mathbf{x}, \mathbf{b}) \quad \mathbf{0}]^{T}) \left(1 - \frac{\partial d}{\partial y} \Big|_{\mathbf{x}} \right) - f_{-}(\mathbf{x} + [\mathbf{0} \quad d(\mathbf{x}, \mathbf{b}) \quad \mathbf{0}]^{T}) \left(1 + \frac{\partial d}{\partial y} \Big|_{\mathbf{x}} \right) \right)^{2}$$

$$\frac{\mathbf{B}(\mathbf{x})}{n \times m} = \frac{\mathbf{B}_z(z)}{n_z \times m_z} \otimes \frac{\mathbf{B}_y(y)}{n_y \times m_y} \otimes \frac{\mathbf{B}_x(x)}{n_x \times m_x}$$

$$\frac{d\mathbf{f}_{+}}{d\mathbf{b}} = -diag\left(\frac{\partial\mathbf{f}_{+}}{\partial y}\right) \underbrace{\mathbf{B}}_{n\times m} - \underbrace{diag(\mathbf{f}_{+})}_{n\times m} \underbrace{\frac{\partial\mathbf{B}}{\partial y}}_{n\times m}$$

$$\frac{d\mathbf{f}_{+}}{d\mathbf{b}} = -diag\left(\frac{\partial \mathbf{f}_{+}}{\partial y}\right) \underbrace{\mathbf{B}}_{n \times m} - \underbrace{diag(\mathbf{f}_{+})}_{n \times n} \underbrace{\frac{\partial \mathbf{B}}{\partial y}}_{n \times m} + \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\mathbf{I}_{-\mathbf{I}} \cdot \mathbf{I}\right] \cdot \left[\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right]^{-1}}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\mathbf{I}_{-\mathbf{I}} \cdot \mathbf{I}\right] \cdot \left[\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right]^{-1}}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\mathbf{I}_{-\mathbf{I}} \cdot \mathbf{I}\right] \cdot \left[\frac{\mathbf{f}_{+}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\mathbf{I}_{-\mathbf{I}} \cdot \mathbf{I}\right] \cdot \left[\frac{\mathbf{f}_{+}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\mathbf{I}_{-\mathbf{I}} \cdot \mathbf{I}\right] \cdot \left[\frac{\mathbf{f}_{+}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\frac{d\mathbf{f}_{-}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\frac{d\mathbf{f}_{-}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{+}}{d\mathbf{b}}\right)^{T} \cdot \left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\frac{d\mathbf{f}_{-}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\frac{d\mathbf{f}_{-}}{\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right] \cdot \left[\frac{d\mathbf{f}_{-}}{d\mathbf{f}_{-}}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{d\mathbf{f}_{-}}{d\mathbf{b}}\right)^{T}\right]}_{2n \times 2n} \underbrace{\left[\left(\frac{$$

