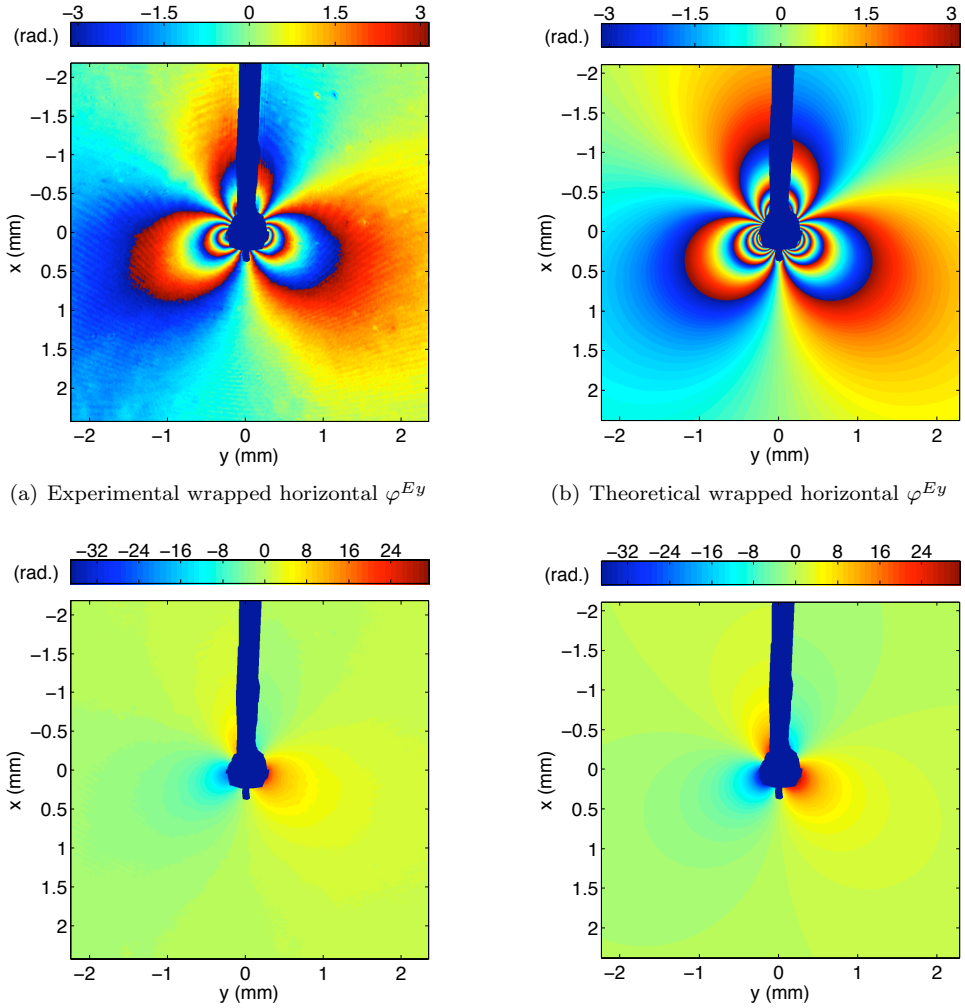


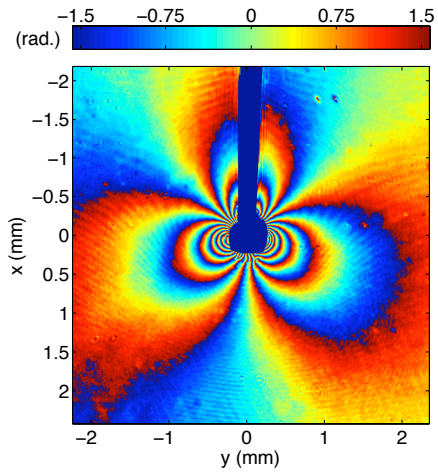
(a) Experimental wrapped horizontal φ^{Ey}

(b) Theoretical wrapped horizontal φ^{Ey}

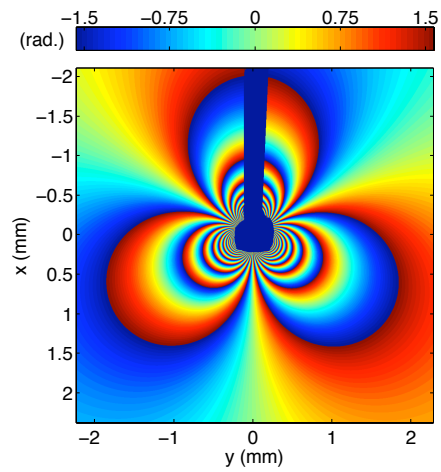
(c) Experimental unwrapped horizontal φ^{Ey}

(d) Theoretical unwrapped horizontal φ^{Ey}

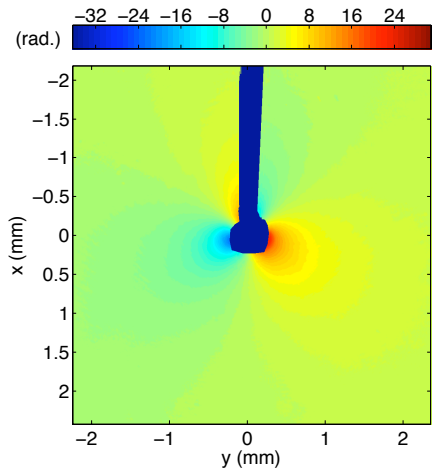
Figure 4.24: Experimental and theoretical φ^{Ey} data for horizontal CGS for specimen HomC1 for $K_I = 0.514$ MPa$\sqrt{\text{m}}$ and $K_{II} = 4.4$ kPa$\sqrt{\text{m}}$ with crack region masked in blue



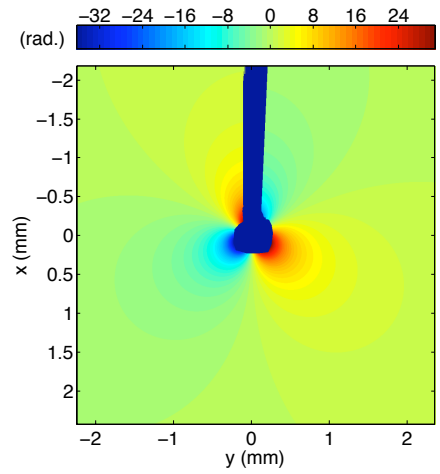
(a) Experimental wrapped horizontal φ_{sum}



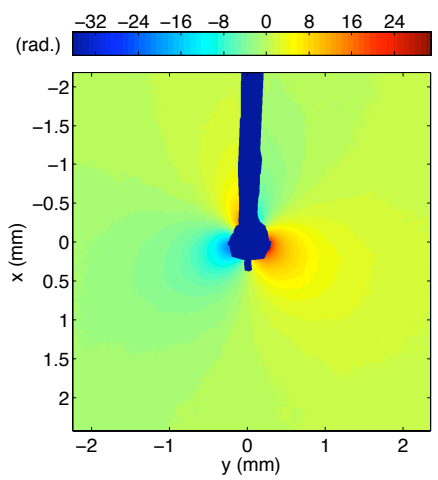
(b) Theoretical wrapped horizontal φ_{sum}



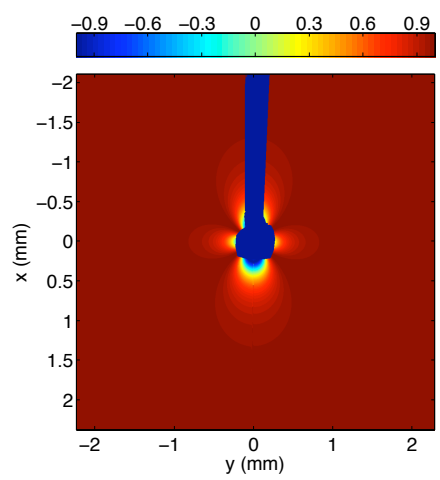
(c) Experimental unwrapped horizontal φ_{sum}



(d) Theoretical unwrapped horizontal φ_{sum}

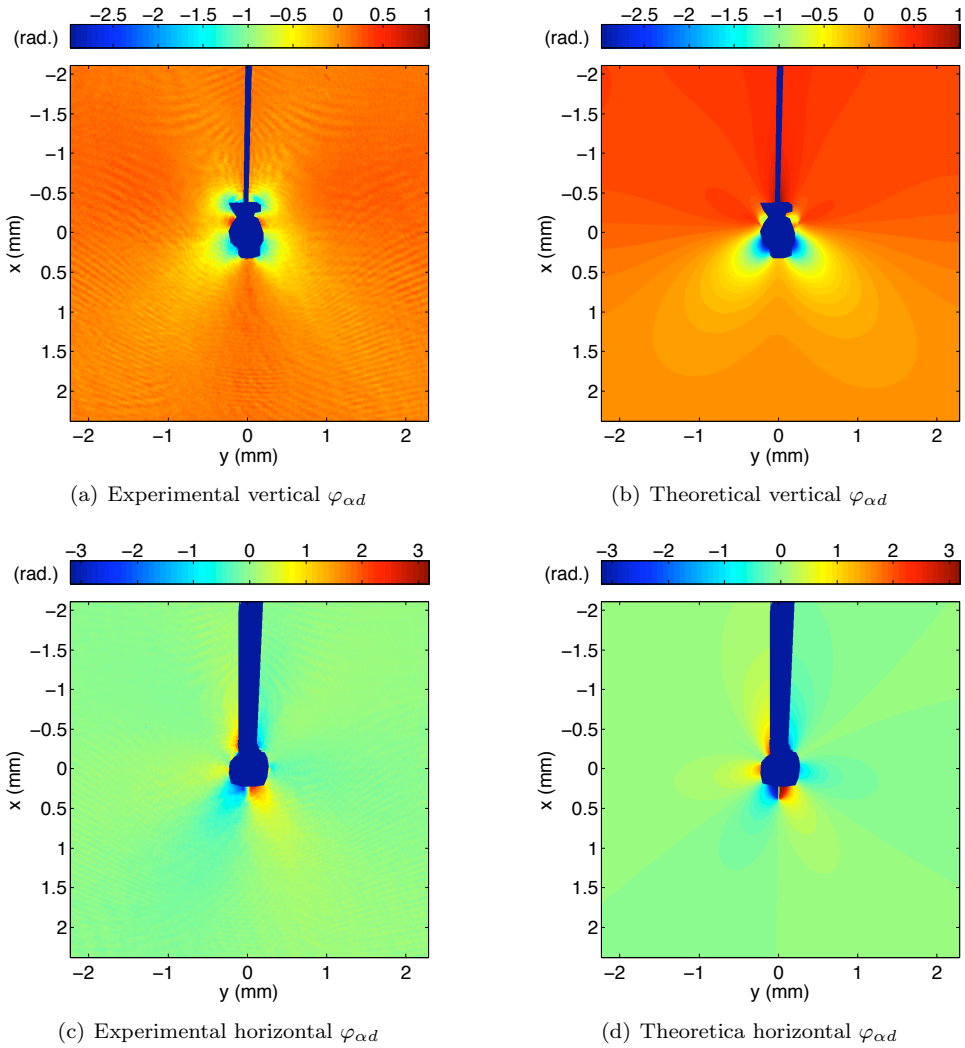


(e) Experimental horizontal φ_{sum} from $\varphi^{Ex} + \varphi^{Ey}/2$



(f) Theoretical horizontal $\cos(\varphi_{diff})$

Figure 4.25: Experimental and theoretical data for horizontal CGS for specimen HomC1 for $K_I = 0.514$ MPa$\sqrt{\text{m}}$ and $K_{II} = 4.4$ kPa$\sqrt{\text{m}}$ with crack region masked in blue



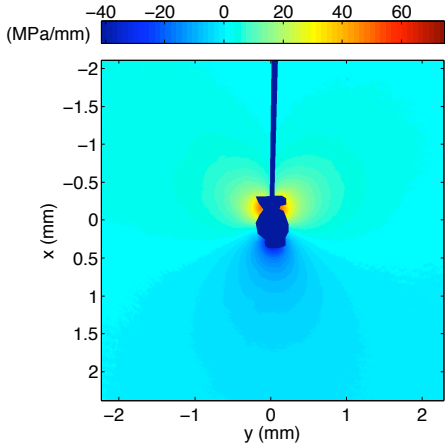
(a) Experimental vertical $\varphi_{\alpha d}$

(b) Theoretical vertical $\varphi_{\alpha d}$

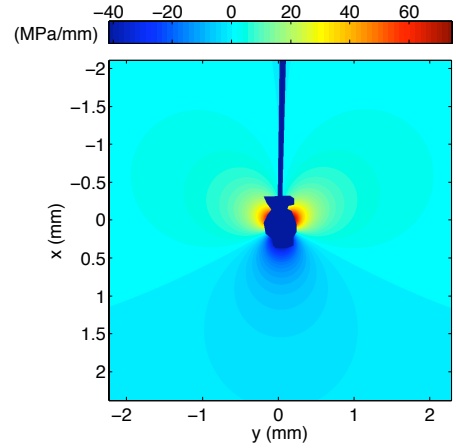
(c) Experimental horizontal $\varphi_{\alpha d}$

(d) Theoretica horizontal $\varphi_{\alpha d}$

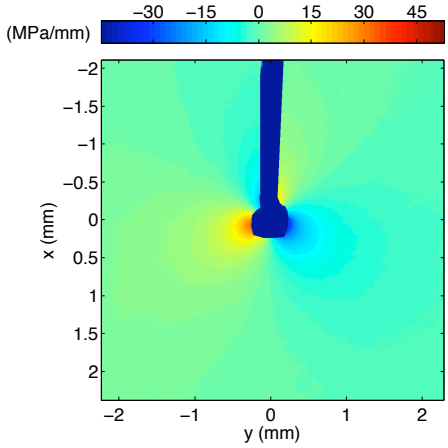
Figure 4.26: Experimental and theoretical data from vertical and horizontal CGS for the extra phase term $\varphi_{\alpha d}$ for specimen HomC1 for $K_I = 0.514$ MPa$\sqrt{\text{m}}$ and $K_{II} = 4.4$ kPa$\sqrt{\text{m}}$ with crack region masked in blue



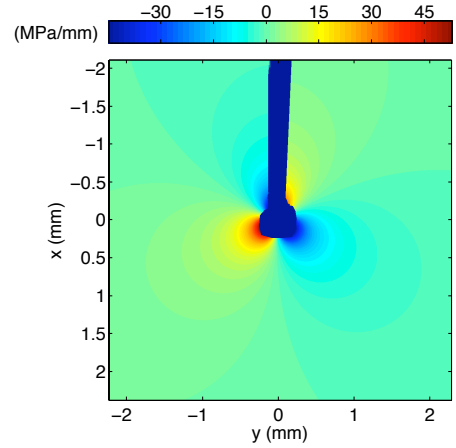
(a) Experimental $\frac{\partial(\sigma_1+\sigma_2)}{\partial x}$



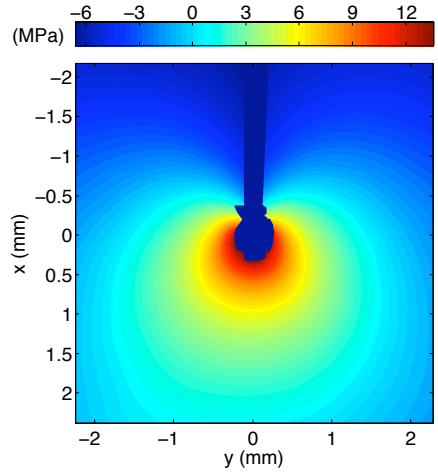
(b) Theoretical $\frac{\partial(\sigma_1+\sigma_2)}{\partial x}$



(c) Experimental $\frac{\partial(\sigma_1+\sigma_2)}{\partial y}$

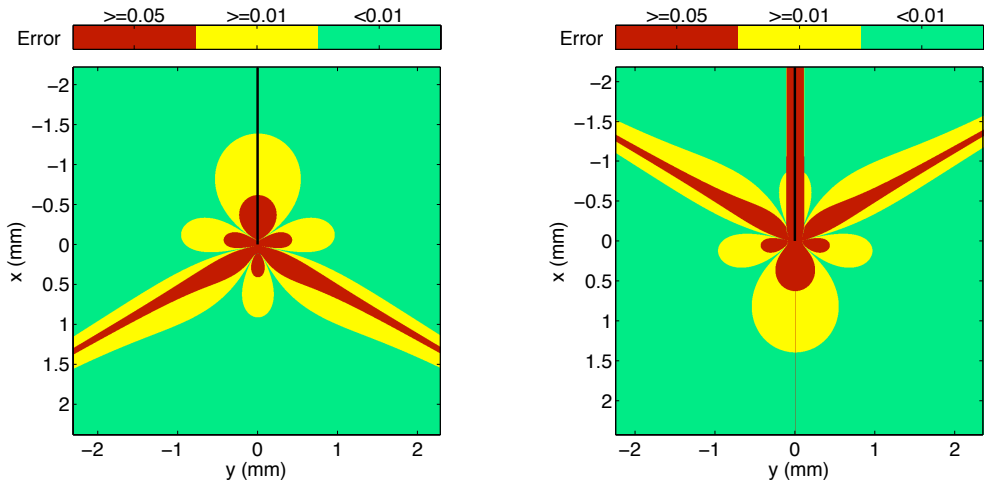


(d) Theoretical $\frac{\partial(\sigma_1+\sigma_2)}{\partial y}$



(e) Experimental $\sigma_1 + \sigma_2 + c_i$

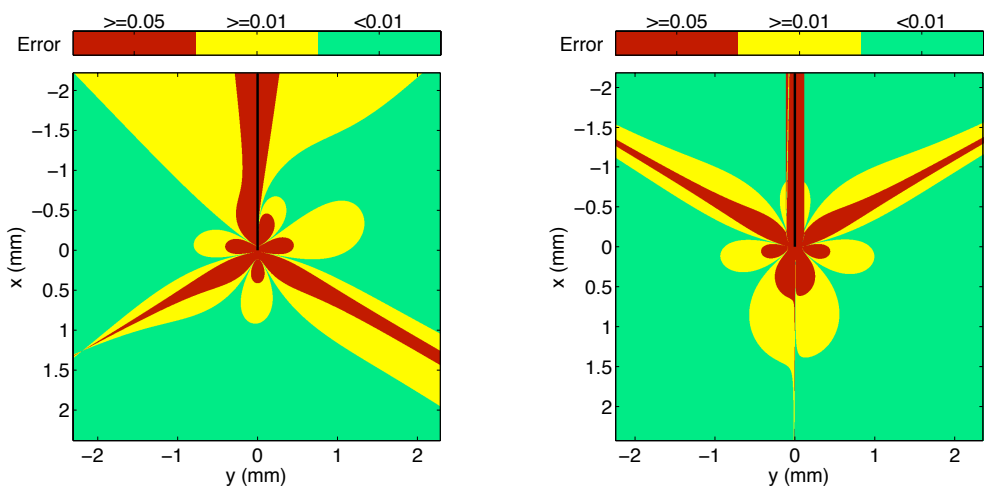
Figure 4.27: Experimental and theoretical data for the derivatives of $\sigma_1 + \sigma_2$ and the experimental integrated $\sigma_1 + \sigma_2 + c_i$ for specimen HomC1 for $K_I = 0.514$ MPa$\sqrt{\text{m}}$ and $K_{II} = 4.4$ kPa$\sqrt{\text{m}}$ with crack region masked in blue



(a) Error for vertical shearing direction

(b) Error for horizontal shearing direction

Figure 4.28: Theoretical error for CGS approximating the derivatives of $\sigma_1+\sigma_2$, assuming K_I loading only for the 4.6 mm $\times$ 4.6 mm field of view and lateral shearing distance of $d_{shear} = 225$ μm [crack indicated in black]



(a) Error for vertical shearing direction

(b) Error for horizontal shearing direction

Figure 4.29: Theoretical error for CGS approximating the derivatives of $\sigma_1+\sigma_2$, assuming $K_I = 0.514$ MPa$\sqrt{\text{m}}$ and $K_{II} = 4.4$ kPa$\sqrt{\text{m}}$ for the 4.6 mm $\times$ 4.6 mm field of view and lateral shearing distance of $d_{shear} = 225$ μm [crack indicated in black]