

# Robust Methods for Optical Interferometry Images

## Ph.D Thesis

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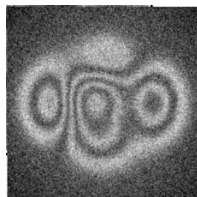
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Co-Asesor: Dr Manuel Servin Guirado.

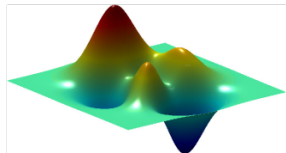
# Algoritmos de Cuadratura

Patrón de franjas:

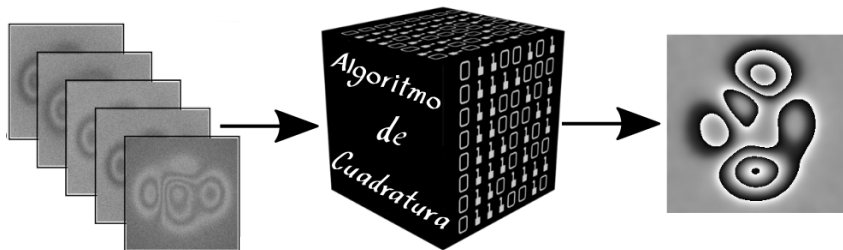
$$I(x, y) = a(x, y) + b(x, y)\cos[\phi(x, y)] \quad (1)$$



$$= a + b \cos\left[ \right]$$

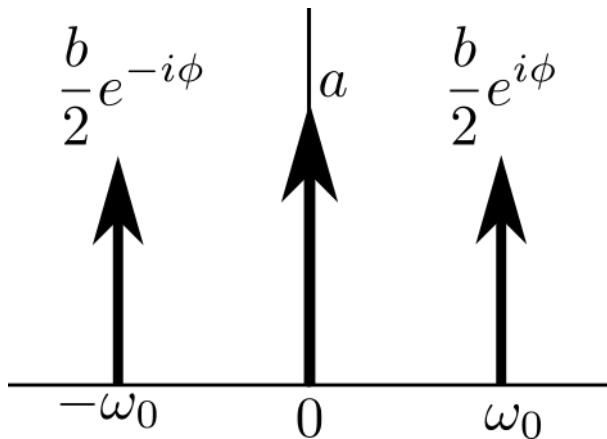


# Algoritmos de Cuadratura



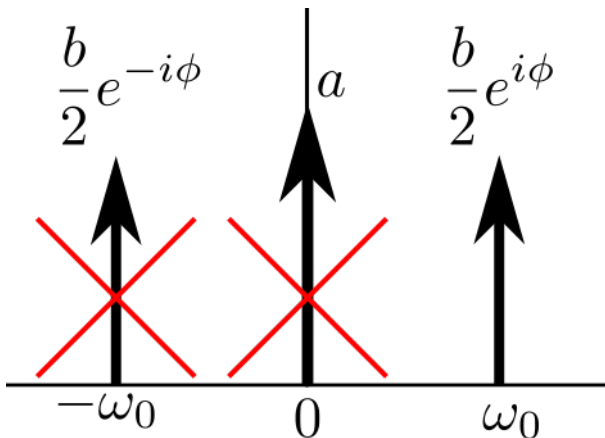
# Algoritmos de Cuadratura

$$\begin{aligned}\mathcal{F}[I(x, y)] &= I(\omega) \\ &= a\delta(\omega) + \frac{b}{2}e^{-i\phi}\delta(\omega - \omega_0) + \frac{b}{2}e^{i\phi}\delta(\omega + \omega_0) \quad (2)\end{aligned}$$



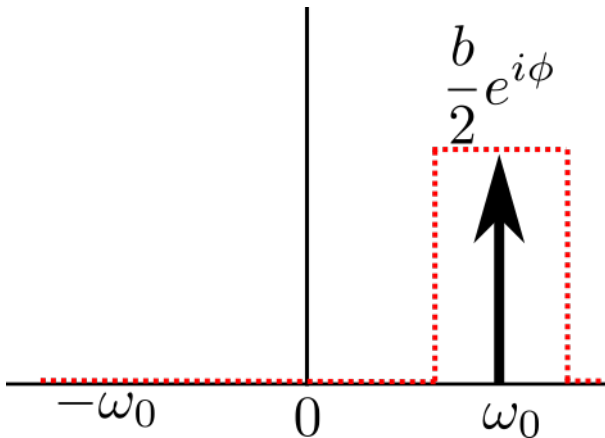
## Algoritmos de Cuadratura

$$H(-\omega_0) = H(0) = 0, H(\omega_0) \neq 0 \quad (3)$$



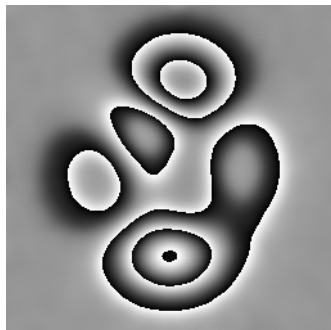
## Algoritmos de Cuadratura

$$I(\omega)H(\omega) = \frac{b}{2}\exp[i\phi] \quad (4)$$



# Algoritmos de Cuadratura

$$\hat{\phi} = \text{atan} \left[ \frac{\text{Im}\{\frac{b}{2}\exp[i\phi]\}}{\text{Re}\{\frac{b}{2}\exp[i\phi]\}} \right] \quad (5)$$



# Filtros Regularizados

$$U[f(x, y)] = \iint_{(x, y) \in S} \left\{ [f(x, y) - I(x, y)]^2 + \eta \left[ \frac{\partial^2 f(x, y)}{\partial x^2} \right]^2 + \eta \left[ \frac{\partial^2 f(x, y)}{\partial y^2} \right]^2 \right\} dx dy \quad (6)$$



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