Correlation Coefficient $$\rho_{xy} = \frac{M_{XY}}{\sqrt{M_{xx} \cdot M_{yy}}} = \frac{< xy >}{\sigma_x \cdot \sigma_y}$$

$$\rho_{xy} \in \{-1 \leq \rho_{xy} \leq 1\} \; \forall \; \sigma \neq 0$$
$$\rho_{xy} = -2 \; \forall \; \sigma = 0$$

Tilt $$\varepsilon = \sqrt{1 - \rho_{xy}^{\,2}}$$

$$\varepsilon = -1 \; \forall \; \rho_{xy}^{\,2} > 1$$

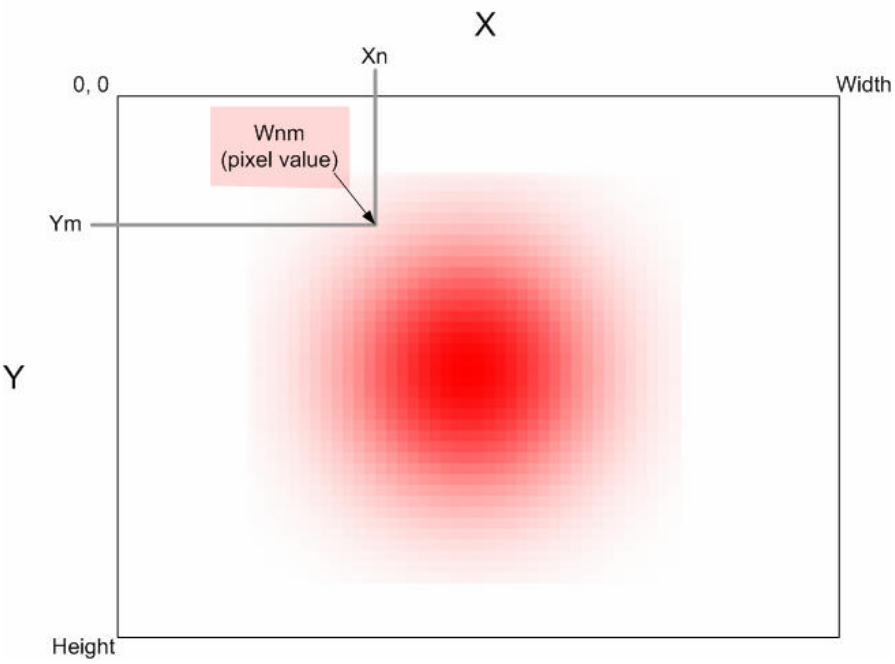
Angle (rad) $$\alpha = \frac{1}{2} \operatorname{atan2}\left(2 \cdot M_{xy}, M_{xx} - M_{yy} \right) \qquad (1)$$

Angle (°) $$\alpha' = \frac{\alpha}{\Pi} \cdot 180° + 180°$$

Mxx $$M_{xx} = \sigma_x^{\,2}$$

Myy $$M_{yy} = \sigma_y^{\,2}$$

Mxy $$M_{xy} = < xy > = \frac{\sum W_{nm} \cdot x_n \cdot y_m}{\sum W_{nm}} - < x > \cdot < y >$$



(1) uses atan2() function instead of arcus tangens in order to avoid division by zero if term below the fraction bar (Mxx – Myy) becomes 0