Angular correlation Function

$$F = 1 + a\frac{\mathbf{p_e}\cdot\mathbf{p_\nu}}{E_e E_\nu} + \frac{\mathbf{J}}{J}\cdot\left(A\frac{\mathbf{p_e}}{E_e} + B\frac{\mathbf{p_\nu}}{E_\nu} + D\frac{\mathbf{p_e}\times\mathbf{p_\nu}}{E_e E_\nu}\right)$$

Spherical Coordinates ($\mathbf{J}$ zAxis)

$\boldsymbol{\beta_e} = (r = \beta_e; \theta = \theta_e; \phi = 0), \quad \cos(\theta_e) \equiv z_e$

$\boldsymbol{\beta_\nu} = (r = 1; \theta = \theta_\nu; \phi = \phi), \quad \cos(\theta_\nu) \equiv z_\nu$

$$\boldsymbol{\beta_e}\cdot\boldsymbol{\beta_\nu} = \beta_e(\cos\theta_e\cos\theta_\nu + \sin\theta_e\sin\theta_\nu\cos\phi) =$$

$$\beta_e(z_e z_\nu + \sqrt{1-z_e^2}\sqrt{1-z_\nu^2}\cos\phi)$$

$$\boldsymbol{\beta_e}\cdot\mathbf{j} = \beta_e\cos\theta_e = \beta_e z_e$$

$$\boldsymbol{\beta_\nu}\cdot\mathbf{j} = \cos\theta_\nu = z_\nu$$

$$\mathbf{j}\cdot(\boldsymbol{\beta_e}\times\boldsymbol{\beta_\nu}) = \beta_e\sin\theta_e\sin\theta_\nu\sin\phi = \beta_e\sqrt{1-z_e^2}\sqrt{1-z_\nu^2}\sin\phi$$

Single Variable: A

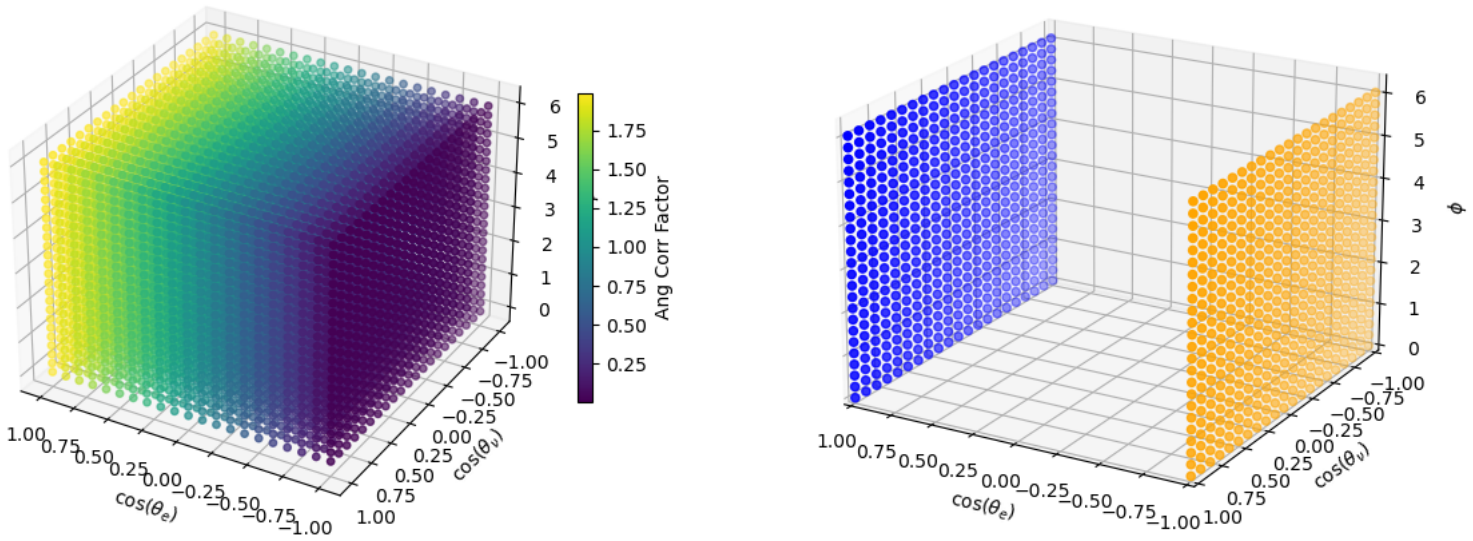

Figure: (Right) Values of the angular correlation Factor with A = 1, E = 5000 keV and rest of variables 0. (Left) Location of maximum (blue, value = 1.995) and minimum (orange, value = 0.005)

Single Variable: A

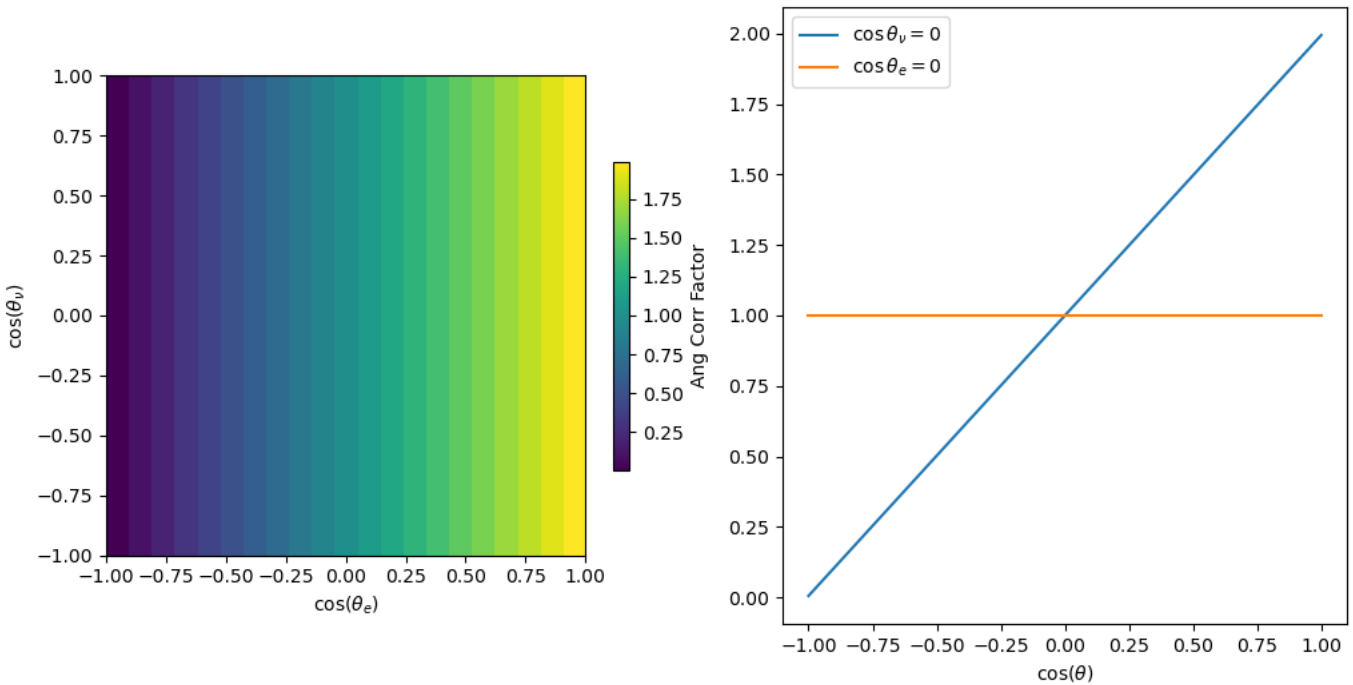

Figure: (Right) 2D projection of previous 3D image at any ϕ (Left) 1D projections at any ϕ, and either $z_e = 0$ or $z_\nu = 0$

Single Variable: B

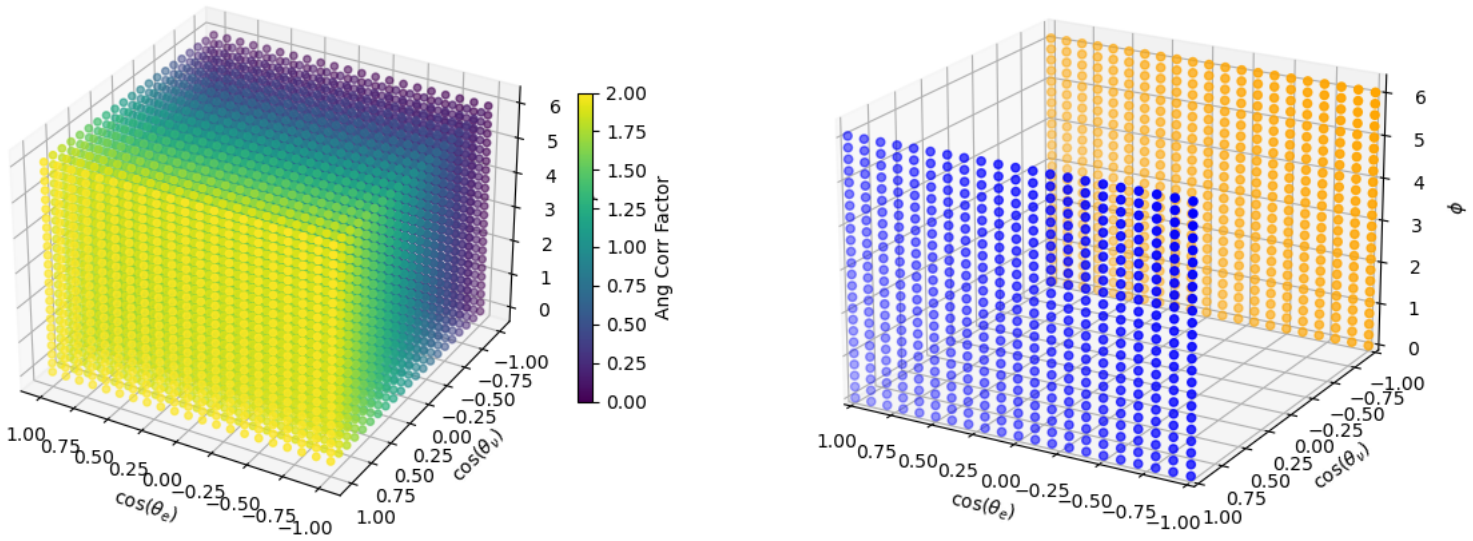

Figure: (Right) Values of the angular correlation Factor with B = 1, E = 5000 keV and rest of variables 0. (Left) Location of maximum (blue, value = 2) and minimum (orange, value = 0)

Single Variable: B

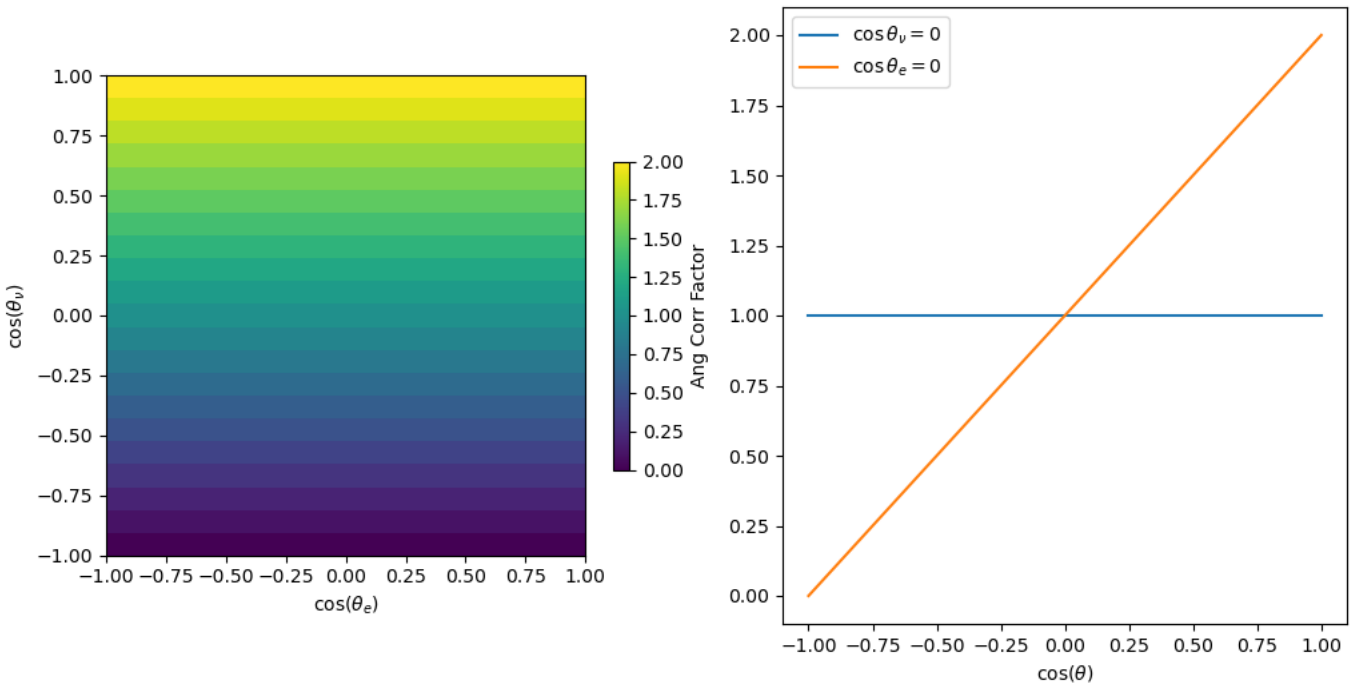

Figure: (Right) 2D projection of previous 3D image at any ϕ (Left) 1D projections at any ϕ, and either $z_e = 0$ or $z_\nu = 0$

Single Variable: a

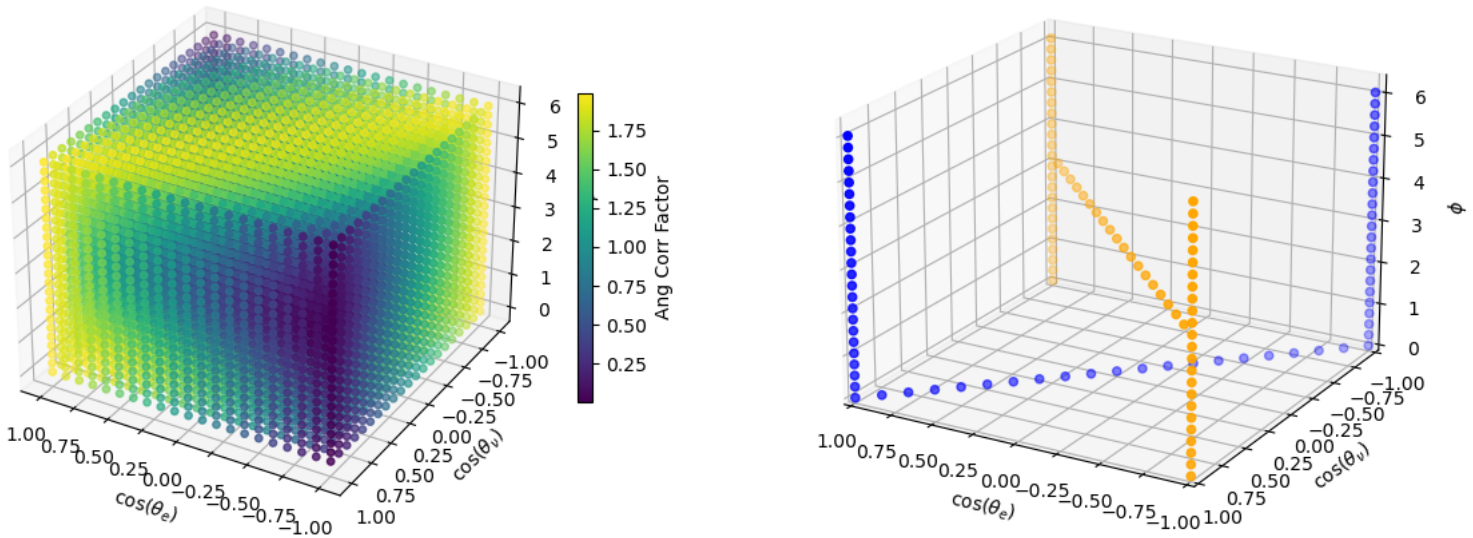

Figure: (Right) Values of the angular correlation Factor with a = 1, E = 5000 keV and rest of variables 0. (Left) Location of maximum (blue, value = 1.995) and minimum (orange, value = 0.005)

Single Variable: a

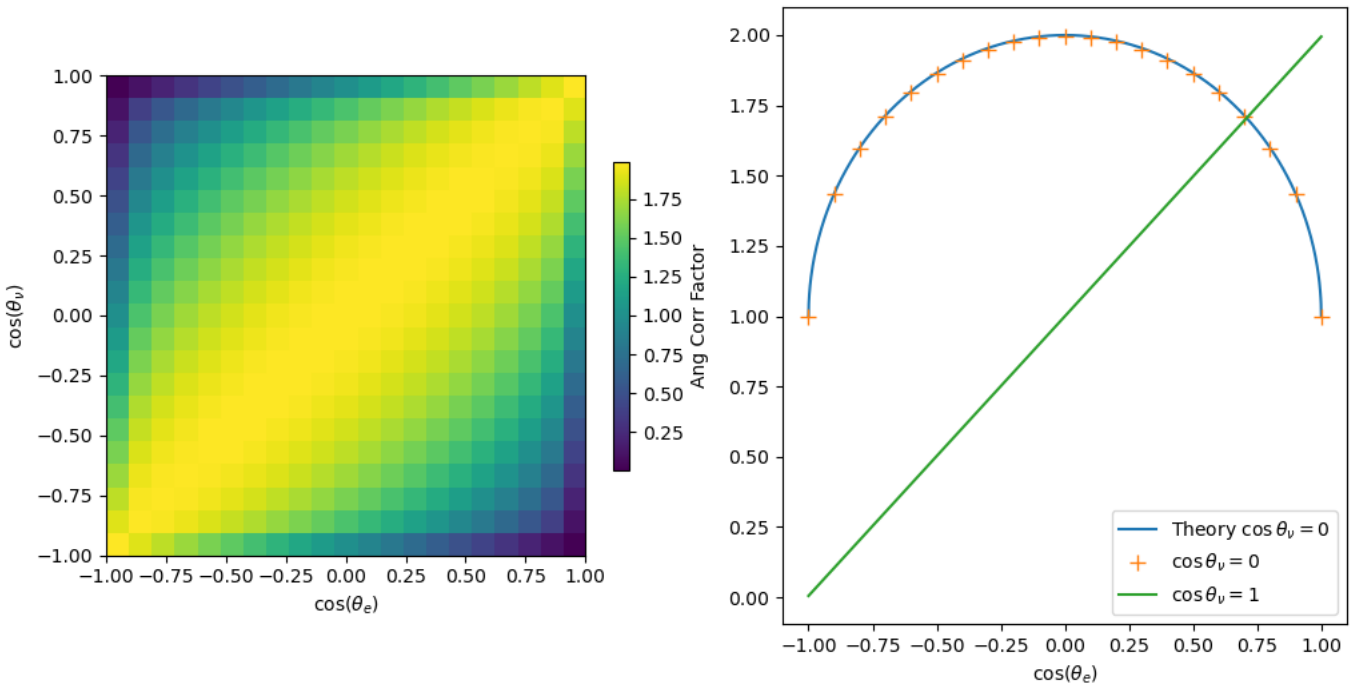

Figure: (Right) 2D projection of previous 3D image at $\phi = 0$ (Left) 1D projections at $\phi = 0$, and either $z_\nu = 0$ or $z_\nu = 1$

Single Variable: D

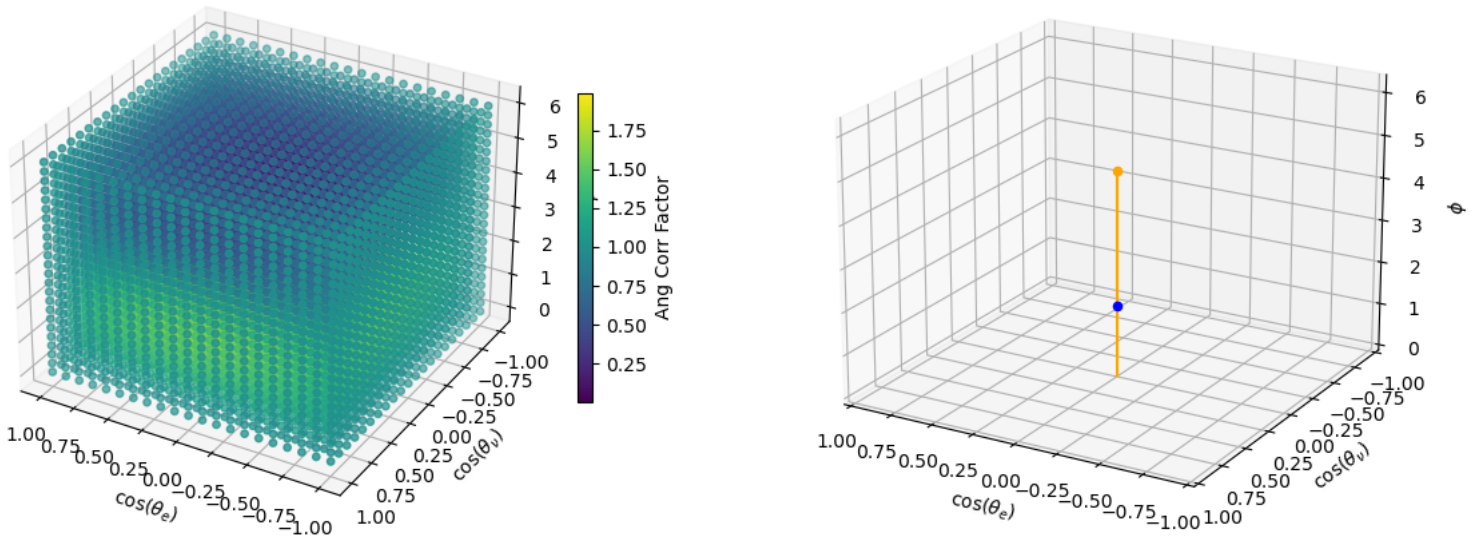

Figure: (Right) Values of the angular correlation Factor with D = 1, E = 5000 keV and rest of variables 0. (Left) Location of maximum (blue, value = 1.995) and minimum (orange, value = 0.005)

Single Variable: D

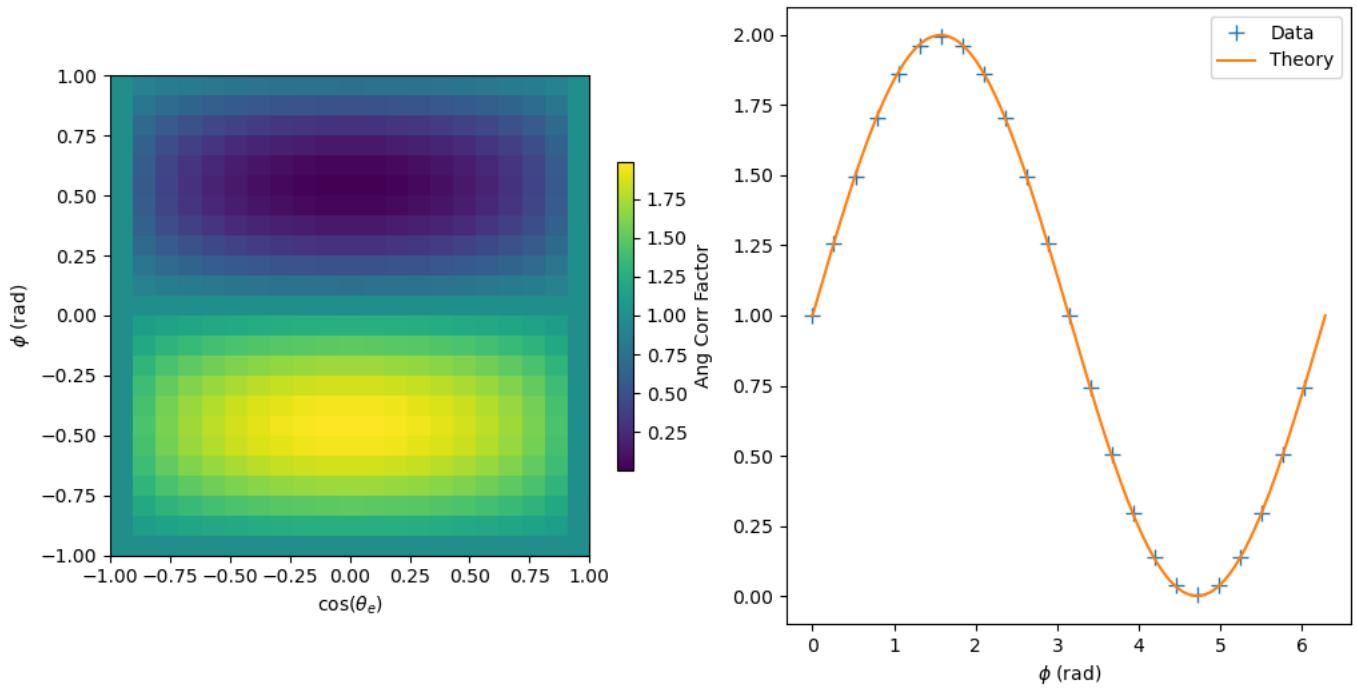

Figure: (Right) 2D projection of previous 3D image at $z_\nu = 0$ (Left) 1D projection at $z_\nu = 0$ and $z_\nu = 0$