To obtain A and B when performing DDM some Fourier analysis is required. Starting from the definition of the image structure function,

$$D(\vec{q},t) = A(\vec{q})(1 - f(\vec{q},t) + B(\vec{q}), \tag{1}$$

which is calculated as

$$D(\vec{q},t) = \langle |\tilde{I}(\vec{q},t+\tau) - \tilde{I}(\vec{q},t)|^2 \rangle_t. \tag{2}$$

Here, $\tilde{I}(\vec{q},t)$ is the Fourier transform of the image at time t and τ is the lag time. By expanding equation 2 we can write this as

$$D(\vec{q},t) = 2\langle |\tilde{I}(\vec{q},t)|^2 \rangle_t - 2\langle \Re[\tilde{I}(\vec{q},t+\tau)\tilde{I}^*(\vec{q},t)] \rangle_t. \tag{3}$$

To get to this point, there is a simplification made that $\langle |\tilde{I}(\vec{q},t+\tau)|^2 \rangle_t$ is independent on τ, i.e. $\langle |\tilde{I}(\vec{q},t+\tau)|^2 \rangle_t = \langle |\tilde{I}(\vec{q},t)|^2 \rangle_t$. By comparing terms dependent and independent of τ in equations 3 and 1, one can write

$$A(\vec{q}) + B(\vec{q}) = 2\langle |\tilde{I}(\vec{q},t)|^2 \rangle_t \tag{4}$$

and

$$A(\vec{q})f(\vec{q},t) = 2\langle \Re[\tilde{I}(\vec{q},t+\tau)\tilde{I}^*(\vec{q},t)] \rangle_t. \tag{5}$$

At this point we can do one of two things. Firstly, we can assume that at very large q, $A(\vec{q}) = 0$. This is because A represents an amplitude term which depends on spatial intensity correlations. Therefore one can calculate

$$B(\vec{q}; q \to \infty) = 2\langle |\tilde{I}(\vec{q}; q \to \infty, t)|^2 \rangle_t, \tag{6}$$

where $q = |\vec{q}|$. It is then simple to calculate $A(\vec{q})$ for all $\vec{q}$ from equation 4.

Alternatively, we can use *a priori* knowledge of the Intermediate Scattering Function (ISF), $f(\vec{q},\tau)$ to say that $f(\vec{q},\tau \to 0)$. With this and equation 5 we can calculate $A(\vec{q})$ as

$$A(\vec{q}) = \lim_{\tau \to 0} 2\langle \Re[\tilde{I}(\vec{q},t+\tau)\tilde{I}^*(\vec{q},t)] \rangle_t. \tag{7}$$