5.3 $\hat{k}_\beta \to 0 \quad \hat{\sigma}_\eta \to 0$

5.109 $$\left(\mu_\ell - \frac{\Delta\nu}{2\rho} + \frac{1}{2}\hat{\nabla}^2_\perp\right)A_\ell(\hat{x})$$
$$- i\int d\hat{\rho}\, d\hat{\eta}\int_{-\infty}^{\infty} d\tau\, e^{i(\nu\hat{\theta}-\mu_\ell)\tau}\,\frac{d\bar{f}_0}{d\hat{\eta}}\, A_\ell(\hat{x}_+) = 0$$

5.131 + 5.132

$$\frac{1}{2}\left[\frac{1}{\hat{r}}\frac{\partial}{\partial\hat{r}}\left(\hat{r}\frac{\partial}{\partial\hat{r}}\right) + \frac{1}{\hat{r}^2}\frac{\partial}{\partial\phi^2}\right]A_\ell(\hat{x}) + \left[\mu_\ell - \frac{\Delta\nu}{2\rho} - \left(1 - \frac{\hat{r}^2}{2\hat{\sigma}_x^2}\right)\frac{1}{\mu_\ell^2}\right]A_\ell(\hat{x}) = \emptyset$$

$$A_\ell(\hat{x}) = A_{\ell,m}(\hat{r})e^{im\phi}, \qquad y = \frac{i\hat{r}^2}{\mu_\ell\hat{\sigma}_x}$$

$$\left[\frac{\partial}{\partial y}\left(y\frac{\partial}{\partial y}\right) - \frac{m^2}{4y} + \frac{\mu_\ell\hat{\sigma}_x}{2i}\left(\mu_\ell - \frac{\Delta\nu}{2\rho} - \frac{1}{\mu_\ell^2}\right) - \frac{y}{4}\right]A_{\ell,m} = 0$$

$$A_{\ell,m} = y^{m/2}e^{-y/2}\alpha_{\ell,m}(y)$$
$$y\alpha''_{\ell,m}(y) + (1+m-y)\,\alpha'_{\ell,m}(y) - \frac{1}{2}\left[m+1+i\mu_\ell\hat{\sigma}_x\left(\mu_\ell - \frac{\Delta\nu}{2\rho} - \frac{1}{\mu_\ell^2}\right)\right]\alpha_{\ell,m}(y) = 0$$

$m = 0$

$$y''\alpha_{\ell,0}(y) + (1-y)\,\alpha'_{\ell,0}(y) - \frac{1}{2}\left[1+i\mu_\ell\hat{\sigma}_x\left(\mu_\ell - \frac{\Delta\nu}{2\rho} - \frac{1}{\mu_\ell^2}\right)\right]\alpha_{\ell,0}(y) = 0$$

$$\mu_\ell^2\left(\mu_\ell - \frac{\Delta\nu}{2\rho}\right) - 1 = \frac{i\mu_\ell}{\hat{\sigma}_x}(2\ell+1)$$

as $\sigma_x \to \infty \implies \mu_\ell^2\left(\mu_\ell - \frac{\Delta\nu}{2\rho}\right) = 1$