$$S_{z_A}|m\rangle = e^{-1/4\sum_{\ell}^{N}|z_\ell|^2}\prod_{i}^{N}(z_i - z_A)\prod_{j<k}^{N}(z_j - z_k)^m \quad , \qquad (8)$$

and

$$S_{z_B}^{\dagger}|m\rangle = e^{-1/4\sum_{\ell}^{N}|z_\ell|^2}\prod_{i}^{N}\left(2\frac{\partial}{\partial z_i} - z_B^*\right)\prod_{j<k}^{N}(z_j - z_k)^m \quad , \qquad (9)$$

for a quasihole or quasielectron, respectively, residing at $z_0$. These operators approximate the action on the system of a thought experiment in which the system is pierced at location $z_0$ with an infinitely thin magnetic solenoid, and through this solenoid is adibatically passed a flux quantum hc/e. This procedure maps the exact ground state onto an exact excited state of the many-body Hamiltonian. The operators slide the ground state over so as to pile up excess charge ± e/m at $z_0$. That they do this most easily seen by interpreting the square of the wavefunction as the probability distribution function of a classical plasma, in the manner

$$\langle m|S_{z_0}^{\dagger}S_{z_0}|m\rangle = \int\cdots\int e^{-\beta\Phi'}\, d^2z_1 \ \ldots \ d^2z_N \quad , \qquad (10)$$

where $\beta = 1/m$ and

$$\Phi' = -2m^2\sum_{j<k}^{N}\ell n|z_j - z_k| + \frac{m}{2}\sum_{\ell}^{N}|z_\ell|^2 - 2m\sum_{i}^{N}\ell n|z_i - z_0| \quad . \qquad (11)$$

$\Phi'$ is the potential energy of particles of "charge" m repelling one another with logarithmic interactions, the natural "coulomb" interaction in two dimensions, being attracted via the same "coulomb" interaction by a background of "charge" density $\sigma_1 = (2\pi a_0^2)^{-1}$, and being repelled by a "charge" 1 particle located at $z_0$. Since this plasma must be locally neutral, electrons distributed themselves uniformly at density $\sigma_m = \sigma_1/m$, except within a Debye length $(a_0/\sqrt{2})$ of $z_0$, where screening charge -1/m electrons accumulates. Similar reasoning works for the quasielectrons, except that the accumulated charge is +1/m electrons. The energy $S_{z_0}|m\rangle$ or $S_{z_0}^{\dagger}|m\rangle$ does not depend on $z_0$, so long as $z_0$ resides inside the sample, so that any linear combination of these is also an eigenstate. In particular, the elementary symmetric polynomials $S_k$ defined by

$$\prod_{i}^{N}(z_i - z_0) = \sum_{k=0}^{N} S_k(z_1, \ \ldots \ , z_N)\ z_0^k \quad , \qquad (12)$$

generate quasiparticles in angular momentum states.

I wish now to determine the two-quasiparticle eigenstates analogous to $\chi_m$ in Eq. (7). To do this, for quasiholes, I shall project the Hamiltonian onto the set of states of the form $S_{z_A}S_{z_B}|m\rangle$ and then diagonalize this projected Hamiltonian. I first need to calculate the normalization integral

$$\langle m|S_{z_B}^{\dagger}S_{z_A}^{\dagger}S_{z_A}S_{z_B}|m\rangle = \int\cdots\int\prod_{j<k}^{N}|z_j - z_k|^{2m}$$