Figures

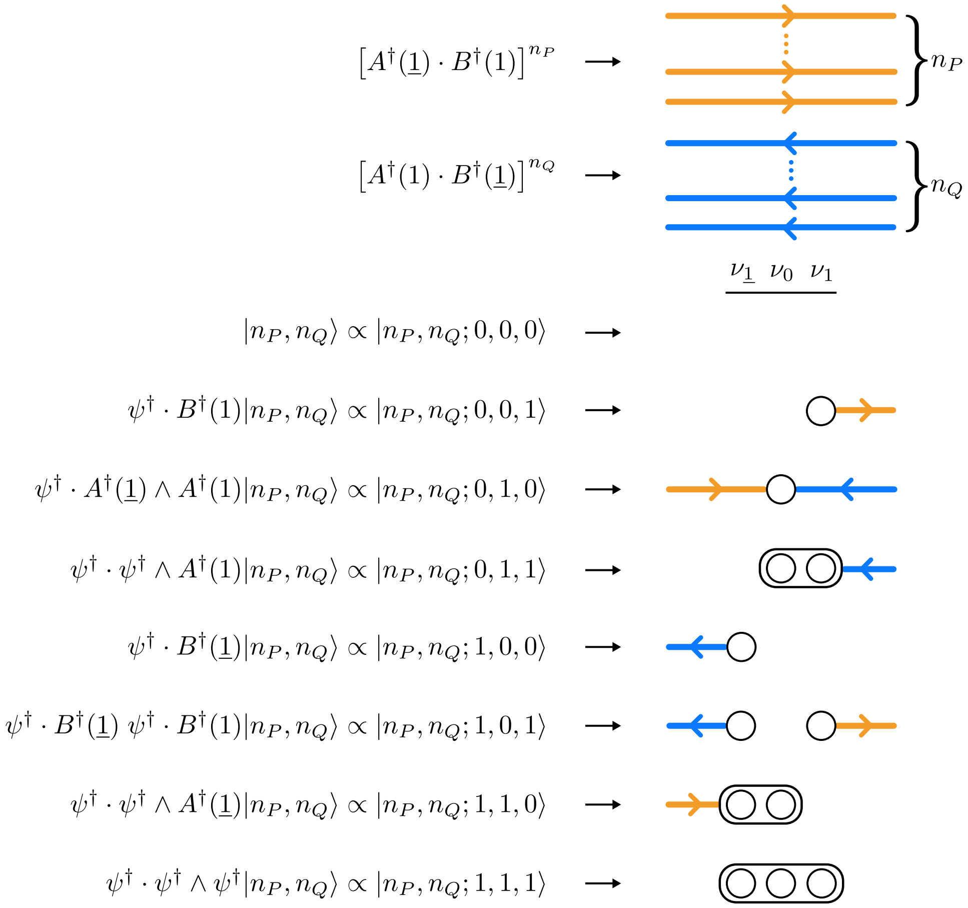

Figure 1: Pictorial representation of un-normalized single-site SU(3) loop string-hadron states defined in Eq. (19). At each site, electric flux of two types can pass through the site, illustrated by rightward (or orange) arrows counted by n_P, and leftward (blue) arrows counted by n_Q. The three gauge singlet gauge-matter excitations, characterized by three fermionic occupation numbers $\nu_{\underline{1}}$, ν_0, ν_1, can alter the electric flux by one unit accross the site according to Eqs. (20) and (21). For states with the total fermion number one, the quarks either source a unit of flux outward to one side, or they sink two incoming units of flux, one unit per side. For states with the total fermion number two, the quarks either source two units of outward flux, one unit per side, or they sink a single incoming unit of flux from one side. Finally, the state with all three fermionic modes occupied is the on-site baryon, which neither sources nor sinks any gauge flux.

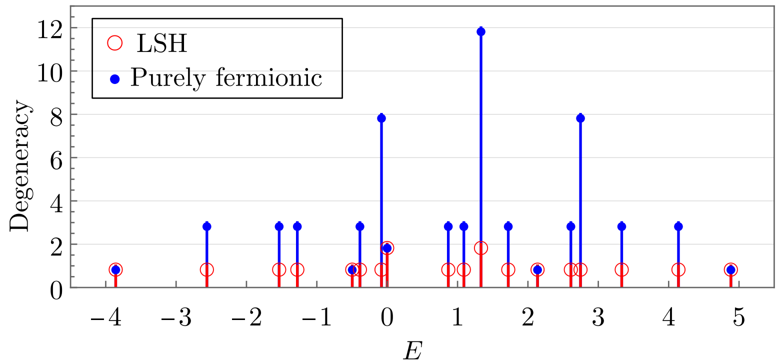

Figure 2: Degeneracy in eigenvalues are plotted against their values for the Hamiltonian with $\mu = x = 1$ that is defined on a lattice of size $N = 2$ with open boundary condition and zero background flux. The eigenvalues are calculated with the LSH framework (red) and the gauge fixed purely fermionic framework (blue). The LSH eigenvalues are obtained from the dimensionless Hamiltonian $H = H_E + H_M + H_I$ where H_E, H_M, and H_I are given in Eqs. (24), (25), and (26), respectively. The details of obtaining eigenvalues from the purely fermionic formulation of the same Hamiltonian are given in Ref. [18]. The eigenvalues in both formulations match exactly with each other up to machine precision. The large number of degenerate states in the purely fermionic case stems from redundancies in this formulation that are discussed in Sec II E in Ref. [18].