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Manipulation of electronic states in triangular graphene quantum dots using optical selection rules ELEFTHERIA KAVOUSANAKI, KESHAV DANI, Okinawa Inst of Sci & Tech — Triangular graphene quantum dots with zigzag edges have been known to exhibit half-filled Fermi edge states with a non-zero ground state magnetic moment. Using the tight binding model, we study the optical selection rules for these structures with and without an external magnetic field and demonstrate that only transitions between states of specific rotational symmetry are allowed in the case of excitation with circularly polarized light. Using these rules, we analyze the optical absorption spectra of quantum dots with either zigzag or armchair edges at zero and nonzero magnetic field, discuss their differences, and show that they allow for the manipulation of the pseudo magnetic properties of these dots using optical pulses.

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