Title: Quasilinear problems with mixed local-nonlocal operator and concave-critical nonlinearities

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Abstract: We will discuss the existence and multiplicity of positive solutions for the following concave-critical problem driven by an operator of mixed order obtained by the sum of the classical p-Laplacian and the fractional p-Laplacian:

$$-\Delta_p u + \varepsilon(-\Delta_p)^s u = \lambda|u|^{q-2}u + |u|^{p^*-2}u \quad \text{in } \Omega, u = 0 \quad \text{in } \mathbb{R}^N \setminus \Omega,$$

where $\Omega \subset \mathbb{R}^N$ is a bounded open set, $\varepsilon \in (0, 1]$, $0 < s < 1 < q < p < N$, and $p^* = \frac{Np}{N-p}$, and $\lambda \in \mathbb{R}$ is a parameter.