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Electromagnetic and axial-vector structure of singly heavy baryons in a pion mean-field approach

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A singly heavy baryon can be viewed as a bound state of $N_c - 1$ valence quarks in a pion mean-field approach, a heavy quark being regarded as a static color source. This aspect provides a great virtue of dealing with both light and singly heavy baryons on an equal footing. The presence of $N_c - 1$ valence quarks polarizes the vacuum and produces pion mean fields, by which the $N_c - 1$ valence quarks are influenced self-consistently. In this picture, the mass spectrum of singly heavy baryons is well described. In the current talk, we present a series of recent investigations on electromagnetic and axial-vector properties of the singly heavy baryons with both spin 1/2 and 3/2. We compare the numerical results with those from lattice data. We finally discuss possible future works on the physics of heavy baryons.

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