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Non-diagonal DVCS and $N \to N^*$ transition GPDs.

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Transition GPDs describe matrix elements of nonlocal partonic QCD operators between ground and excited baryon states and provide new tools for quantifying and interpreting the structure of baryon resonances in QCD.

We consider a description of non-diagonal Deeply Virtual Compton Scattering process involving a transition between anucleon and a nucleon resonance in the pion-nucleon system within the framework of transition GPDs. We address the physical content of $N \to N^*$ and $N \to \Delta$ transition GPDs, review the existing theoretical models and present theoretical estimates of related observables for the kinematic conditions corresponding to the experimental studies at JLab@12GeV. We also discuss the perspective of exploring resonance production with help of transition GPDs and consider the application of the Froissart-Gribov projections to study excitation of nucleon resonances by means of spin-J QCD probes.

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