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## The $D_{03}(2380)$ dibaryon resonance excitation in $pd$ collision in the GeV region

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At present as one of the most realistic candidate to dibaryon resonance is considered the resonance  $D_{IJ} = D_{03}$  observed by WASA@COSY \cite{WASA11} in the total cross section of the reaction of two-pion production  $pn \rightarrow d\pi^0\pi^0$ , here  $I$  is the isospin and  $J$  is the total angular momentum of this resonance. Very similar resonance structure was observed by ANKE@COSY in the differential cross section of the two-pion production reaction  $pd \rightarrow pd\pi\pi$  at beam energies 0.8-2.0 GeV with high transferred momentum to the deuteron at small scattering angles of the final proton and deuteron \cite{Cyrkov}. In the distribution over the invariant mass  $M_{d\pi\pi}$  of the final  $d\pi\pi$  system the resonance peaks were observed at  $M_{d\pi\pi} \approx 2.38$  GeV \cite{Cyrkov} that is the mass of the isoscalar two-baryon resonance  $D_{IJ} = D_{03}$ , while the kinematic conditions differ considerably from that in Ref. \cite{WASA11}. This data we analyzed in Ref. \cite{UzikovTurs} assuming excitation of the  $D_{03}$  resonance via t-channel  $\sigma$ -meson exchange between the proton and deuteron and using the two-resonance mechanism of the  $D_{03}$  resonance decay \cite{PK2013}. The shapes of the distributions over the invariant masses of the final  $d\pi\pi$  and  $\pi\pi$  systems were explained qualitatively in \cite{UzikovTurs} assuming the lowest values of the orbital angular momenta in the vertices  $\sigma d \rightarrow D_{03}$  ( $L = 2$ ),  $D_{03} \rightarrow D_{12} + \pi$  ( $l_1 = 1$ ),  $D_{12} \rightarrow d + \pi$  ( $l_2 = 1$ ). In this work we study the role of higher orbital momenta in those vertices ( $L = 2, 4$ ,  $l_1 = 1, 3, 5$ ,  $l_2 = 1, 3$ ). Furthermore, a contribution of the  $D_{03}$  excitation to the  $pd$ -backward elastic scattering is studied in the 1 GeV region.

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