Dear Htun Htun, 2024.8.10

There are particles α, β and γ. The intrinsic spin σ_α, σ_β and σ_γ belong to the particle α, β and γ, respectively. $\vec{p}_\alpha$ is a relative momentum between particle β and γ. The second Jacobi momentum $\vec{q}_\alpha$ is the one between particle α and the center mass of the subsystem (β and γ). The angular momenta l and λ are corresponding to $\vec{p}_\alpha$ and $\vec{q}_\alpha$, respectively. The total spin is J which is constructed by λ and S. The quantum number S consists of $\bar{j}$ and σ_α. The total subsystem spin is given Σ which is made from l and Σ. The spin Σ is given by σ_β and σ_γ.

$$
\begin{aligned}
&\lambda + S \to J, \\
&\bar{j} + \sigma_\alpha \to S, \\
&l + \Sigma \to \bar{j}, \\
&\sigma_\beta + \sigma_\gamma \to \Sigma. \\
&|\alpha\rangle = |(\sigma_\beta \sigma_\gamma)\Sigma, (l\Sigma)\bar{j}, (\bar{j}\sigma_\alpha)S, (\lambda S)J\rangle
\end{aligned} \tag{1}
$$

We prepare the partial wave quantum numbers set in Table 1 and Table 2 for 0^+ state and 2^+ state, respectively.

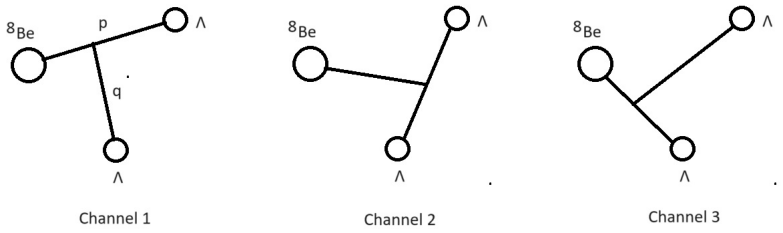

Figure 1: Particle channels α.

Best regards, Hiroyuki

Table 1: Channels of ${}^{10}_{\Lambda\Lambda}$Be(0^+).

State nr.	α	J	λ	S	$\bar{j}$	l	Σ	σ_α	σ_β	σ_γ
1	1	0	0	0	1/2	0	1/2	1/2	1/2	0
2	1	0	2	2	3/2	0	3/2	1/2	1/2	2
3	1	0	2	2	5/2	0	5/2	1/2	1/2	2
4	2	0	0	0	0	0	0	0	1/2	1/2
5	2	0	2	2	0	0	0	2	1/2	1/2

Table 2: Channels of ${}^{10}_{\Lambda\Lambda}$Be(2^+).

State nr.	α	J	λ	S	$\bar{j}$	l	Σ	σ_α	σ_β	σ_γ
1	1	2	2	0	1/2	0	1/2	1/2	1/2	0
2	1	2	0	2	3/2	0	3/2	1/2	1/2	2
3	1	2	0	2	5/2	0	5/2	1/2	1/2	2
4	2	2	2	0	0	0	0	0	1/2	1/2
5	2	2	0	2	0	0	0	2	1/2	1/2