Jh property - proof

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$$\underbrace{J_u(bch(\alpha,\beta))}_{LHS} \overset{?}{=} \underbrace{J_u(\alpha)+J_u(\beta /\!/ RC_u^{\alpha})/\!/C_u^{-\alpha}}_{RHS}$$

silly! It is enough to prove that

$$J_u(bch(\alpha,s\beta)) = J_u(\alpha)+J_u(s\beta/\!/RC_u^{\alpha})/\!/C_u^{-\alpha}$$

for every s. w/ $\gamma = bch(\alpha, s\beta)$,

$$\frac{d}{ds}LHS = \beta/\!/RC_u^{\gamma}/\!/div_u/\!/C_u^{-\gamma}$$

$$\frac{d}{ds}RHS = \beta/\!/RC_u^{\alpha}/\!/\underbrace{\frac{1-e^{-ad\,\beta/\!/RC_u^{\alpha}}}{ad\,\cdot\,-}}_{\text{commutes \& disappears}}/\!/RC_u^{\beta/\!/RC_u^{\alpha}}/\!/div_u/\!/C_u^{-\beta/\!/RC_u^{\alpha}}/\!/C_u^{-\alpha}$$

= same thing. $\square$

Question does $\gamma_s := bch(\alpha, s\beta)$ commute with $\frac{d}{ds}\gamma_s$?

$$\frac{d}{ds}\gamma_s = \beta/\!/\frac{ad\,\gamma_s}{1-e^{-ad\,\gamma_s}} \quad \ldots \text{ No.}$$