Relationship between 1 to $n+1$ and 2 to n Parke-Taylor amplitudes in light front perturbation theory CHRISTIAN A. CRUZ SANTIAGO, The Pennsylvania State University, ANNA M. STASTO, The Pennsylvania State University; RIKEN BNL Center; Polish Academy of Sciences — Parke-Taylor amplitudes give the exact tree level amplitudes for an arbitrary number of external on-shell gluons. In time ordered perturbation theory it is almost trivial to see that a relationship exists between the 1 to $n+1$ amplitude ($M_{1\rightarrow n+1}$) and the 2 to n amplitude ($M_{2\rightarrow n}$). In light front perturbation theory it is not obvious as energy denominators change when taking an external leg from the final state into the initial state. We have found that when the helicities for $M_{2\rightarrow n}$ are $M_{+-\rightarrow+...+}$, $M_{2\rightarrow n}$ can be found from $M_{1\rightarrow n+1}$ by performing an analytical continuation and taking an external leg from each of its graphs from the final state into the initial state. The relationship found was $M_{2\rightarrow n} = -M_{1\rightarrow n+1}$, which for the helicities specified is equal to zero.

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