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Neutron Single Particle Strengths in Z=20,22,24 Isotopes[1] JIAYAN DAI, Chinese University of Hong Kong, JENNY LEE, BETTY TSANG, National Superconducting Cyclotron Laboratory, Michigan State University, USA — Spectroscopic factor (SF) is one of the most fundamental quantities in nuclear physics. It provides the information of the single particle strength of different states in a nucleus. In the present work, a consistent analysis developed in ref [1] is used to extract SFs for nuclei with ^{40}Ca core. We examine the evolution of the single particle states in ^{41,43,45,47}Ca to understand how the description of the shell model evolves from N=20 to N=28 closed shell. While the ground states of the Ca isotopes are well described by the simple shell model consisting of valence nucleons and an inert ^{40}Ca core, our analysis suggests that excited states of these nuclei cannot be described so simply because of significant fragmentation of the single particle strength. The fragmentation is more obvious when we compare the N=27 nuclei of ^{47}Ca and ^{51}Cr. Similarly, we see the fragmentation of the levels increases when more protons are added to the ^{40}Ca core in the N=29 region for ^{47}Ar, ^{49}Ca, ^{51}Ti and ^{53}Cr nuclei. In the poster, comparisons of the experimental and the shell model predicted levels and spectroscopic factors will be presented. Reference: [1] M.B.Tsang et. al., Phys. Rev. Lett. **95**, 222501 (2005).

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