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Baryon Resonances from Measurements of Strange Baryon Production¹

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The spectrum of excited states of the nucleon has been a topic of interest for both experimental and theoretical investigations for many years. The goal is to measure the masses of resonances of the nucleons (N^*), of the hyperons (Y^*) and of other baryons such as the Cascade. Once these masses are known, then theoretical calculations (either models or lattice gauge theory) can be used to interpret the resonance spectrum, hence making a connection with the underlying framework of QCD. Put simply, the confinement of quarks in baryons is not yet completely understood. In this talk, the spectrum of baryon resonances will be reviewed and evidence for new baryon resonances coming from measurements of strange baryon production will be discussed. Many of the new resonances come from comparisons of photo- and electro-production data with theoretical models. Even with these new resonances, many of the resonances predicted by the constituent quark model are not found. This suggests that lattice gauge calculations may be necessary to interpret the spectrum of baryon resonances, as some theorists have speculated for many years. Nonetheless, future experimental work is needed to clarify the situation. Some suggestions for future directions will be presented.

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