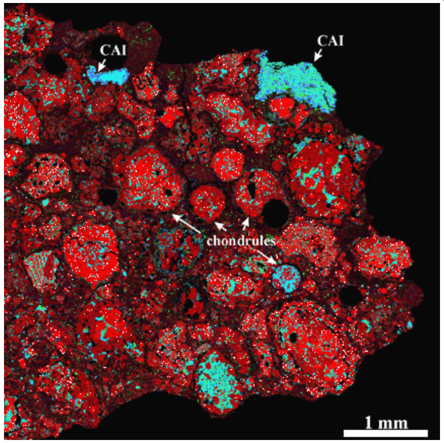
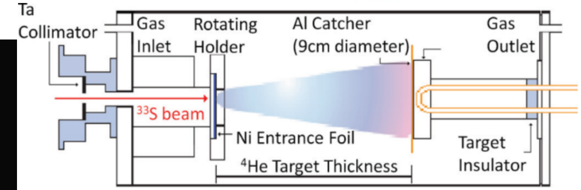
# Further Probing of the Early Solar System through AMS measurement of $^{36}$Cl

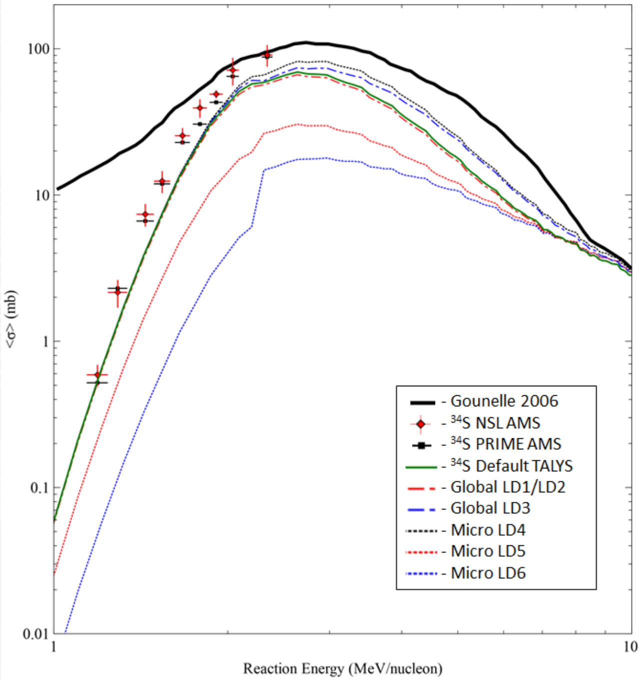
$^{36}$Cl is known to have been present in the Early Solar System because of excess abundances of its daughter isotopes found in meteoritic material. An important possible $^{36}$Cl production method is via local particle irradiation by the proto-Sun, where H and He are accelerated onto dust and gas. We have assessed the viability of this production mechanism through cross-section measurements of these reactions at several relevant energies.



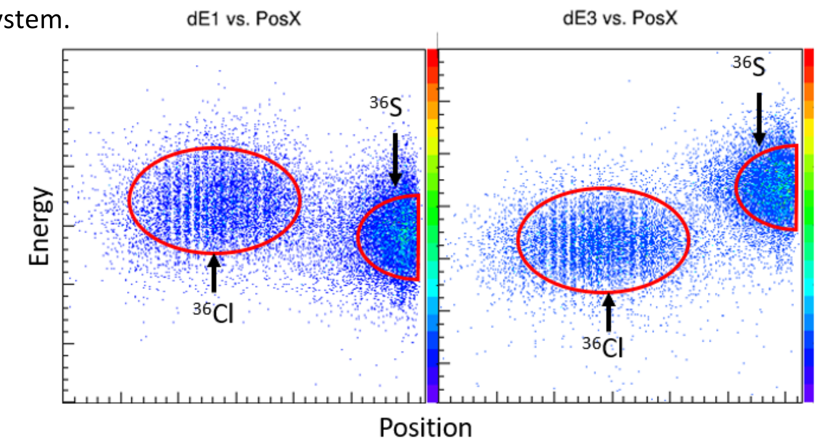
A. Krot, H. Yurimoto, I. Hutcheon, and G. J. MacPherson. Nature, 434:998,2005.




This work required two parts, production of $^{36}$Cl and subsequent measurement with Accelerator Mass Spectrometry (AMS). First, $^{34}$S was accelerated into a $^{3}$He-filled gas cell to produce $^{36}$Cl, after which the produced material was chemically processed at Purdue's PRIME Lab. Then, the resulting material was analyzed using AMS and Gas Filled Magnet techniques.




The reaction cross section as a function of energy was then determined by counting the $^{36}$Cl atoms at several different energies. Finally, our measurements were used to produce more accurate models of the formation and isotopic enrichment of our Solar System.




T. Anderson *et al*., Phys. Rev. C **101**, 025801 (2020)

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