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Auto-tuning for NMR probe using LabVIEW CARMEN QUEN, STEPHANIE PHAM, OSCAR BERNAL, California State University of Los Angeles — Typical manual NMR-tuning method is not suitable for broadband spectra spanning several megahertz linewidths. Among the main problems encountered during manual tuning are pulse-power reproducibility, baselines, and transmission line reflections, to name a few. We present a design of an auto-tuning system using graphic programming language, LabVIEW, to minimize these problems. The program uses a simplified model of the NMR probe conditions near perfect tuning to mimic the tuning process and predict the position of the capacitor shafts needed to achieve the desirable impedance. The tuning capacitors of the probe are controlled by stepper motors through a LabVIEW/computer interface. Our program calculates the effective capacitance needed to tune the probe and provides controlling parameters to advance the motors in the right direction. The impedance reading of a network analyzer can be used to correct the model parameters in real time for feedback control.

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