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Anomalous Effect of Surface Diffusion on NMR Signal: Tracing the Fiber Geometry VADYM APALKOV, NERANJAN EDIRISINGHE, GENNADY CYMBALYUK, Georgia State University — We show the strong qualitative effect of the surface diffusion channel on the echo attenuation of the NMR signal from restricted geometry, e.g. fiber system. In some range of parameters of the system the residual echo signal, which is obtained by subtracting the background value, can have anomalous behavior, which means that the echo signal has a maximum value at some finite value of the magnitude of the gradient pulses. This fact can be used to enhance the accuracy of the measurements by studying the echo signal around the maximum value. Effect described here could be also used for tuning the MRI measurements to trace fibers with particular characteristic diameters or for timely detection of changes in the diffusion coefficients and fiber diameters.

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