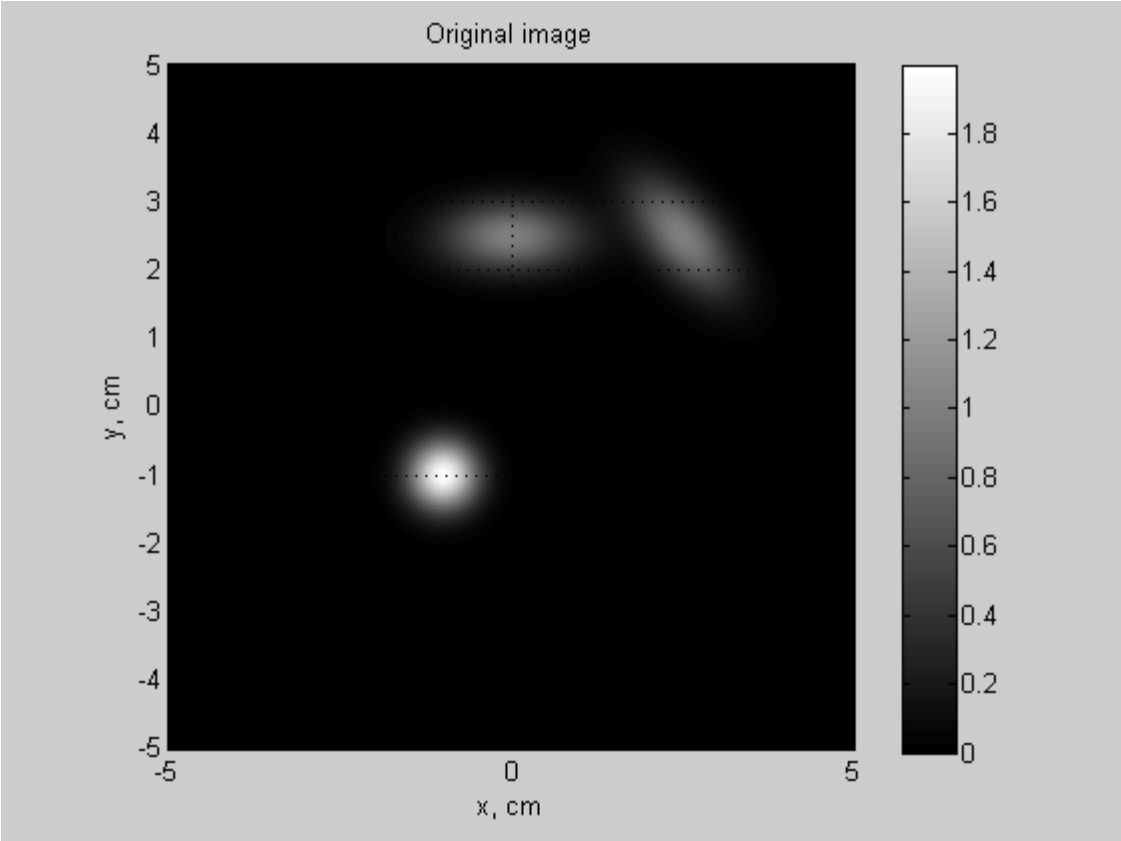
Original image 1
First set of calculations 2
Gradient echo sequence signals 3
Gradient echo sequence, reconstructed images 4
Gradient echo sequence interpolated images 5
Projection sequence signals 6
Projection sequence reconstructed images 7
Projection sequence interpolated images 8
ODIN test calculation 9
ODIN signals 10
ODIN reconstructed images 11
ODIN interpolated images 12

Original image



First set of calculations

Table 1 (gradients in Hz/cm)

	Δ=0.5 cm	**Δ=1 cm**	**Δ=2cm**
TE = 0.5 ms	4000	2000	1000
TE = 1 ms	2000	1000	500
TE = 2 ms	1000	500	250

Table 2 (gradients in μT/cm)

	Δ=0.5 cm	**Δ=1 cm**	**Δ=2cm**
TE = 0.5 ms	123.3	61.7	30.8
TE = 1 ms	61.7	30.8	15.4
TE = 2 ms	30.8	15.4	7.7

The simulation id based on the following formula for FID attenuation due to diffusion[1]:

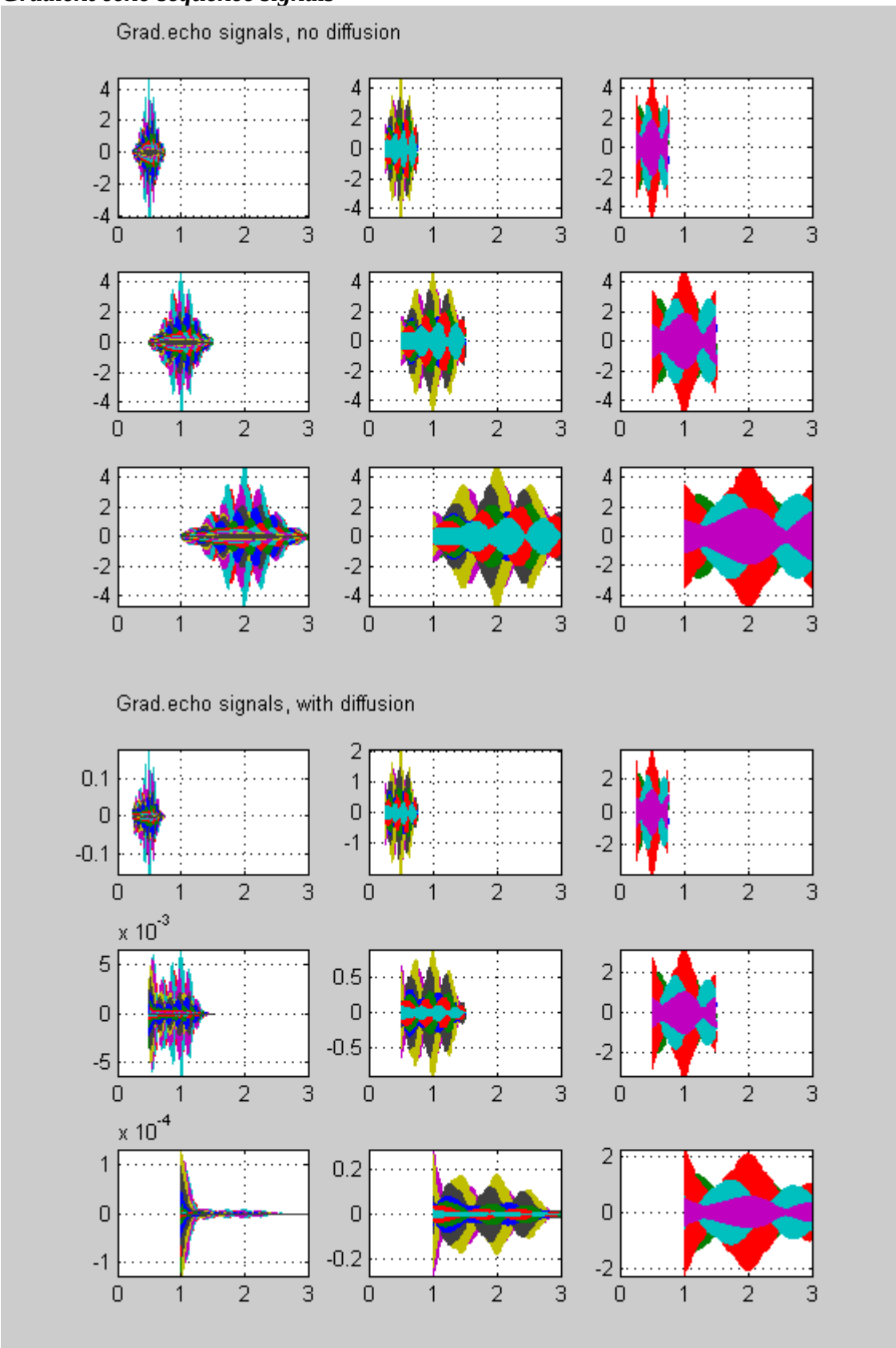
$$A(t) = \exp\left\{-4\pi^2 D \int_0^t k^2(t')dt'\right\},$$

$$k(t) = \frac{\gamma}{2\pi}\int_0^t G(t')dt'$$

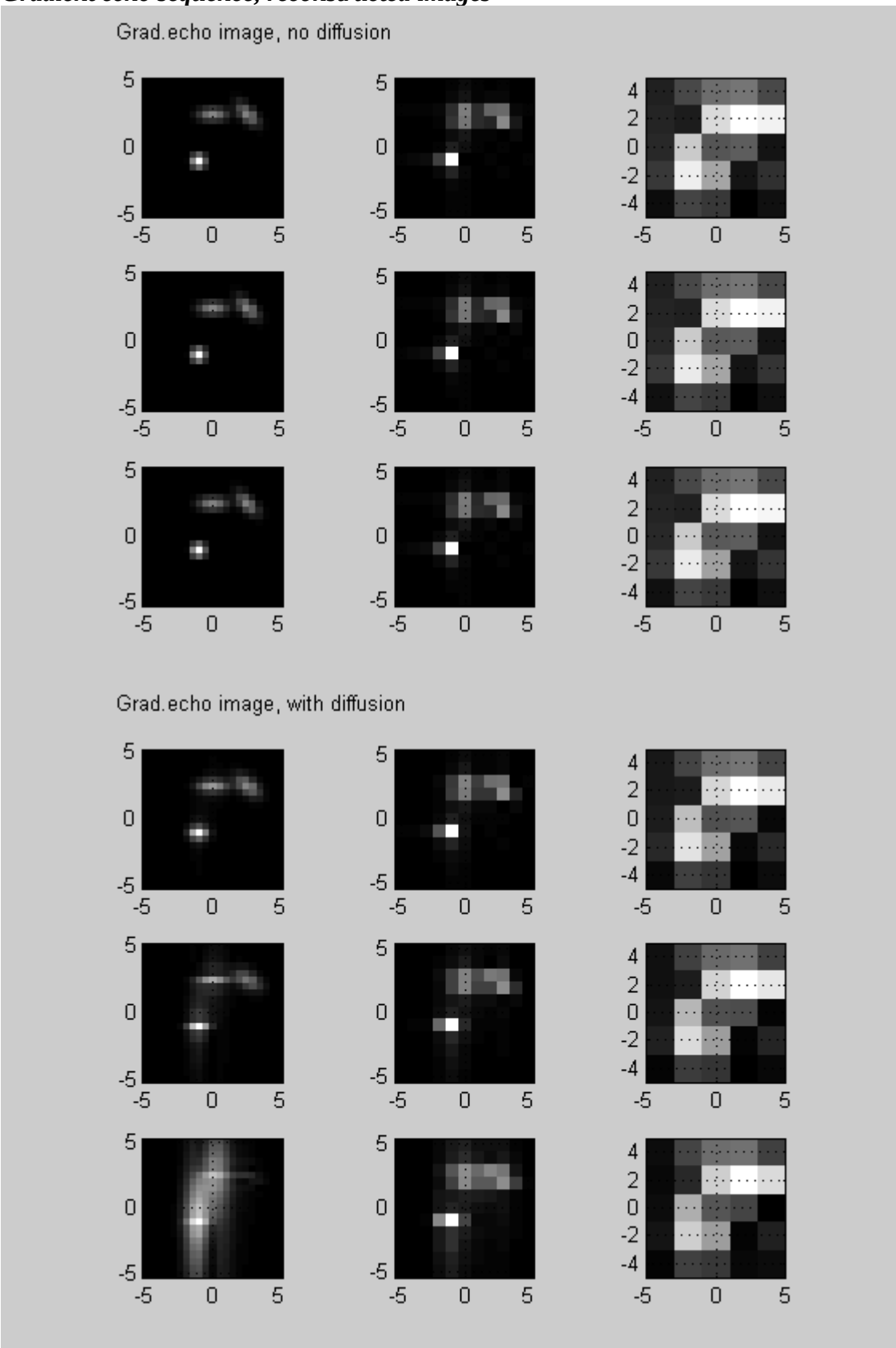
Diffusion coefficient $D = 500\ cm^2 / s$

[1] A.G.Webb, Optimizing the point spread function in phase-encoded magnetic resonance microscopy, Concepts in Magnetic Resonance Part A, Vol. 22A(1) 25-36 (2004)

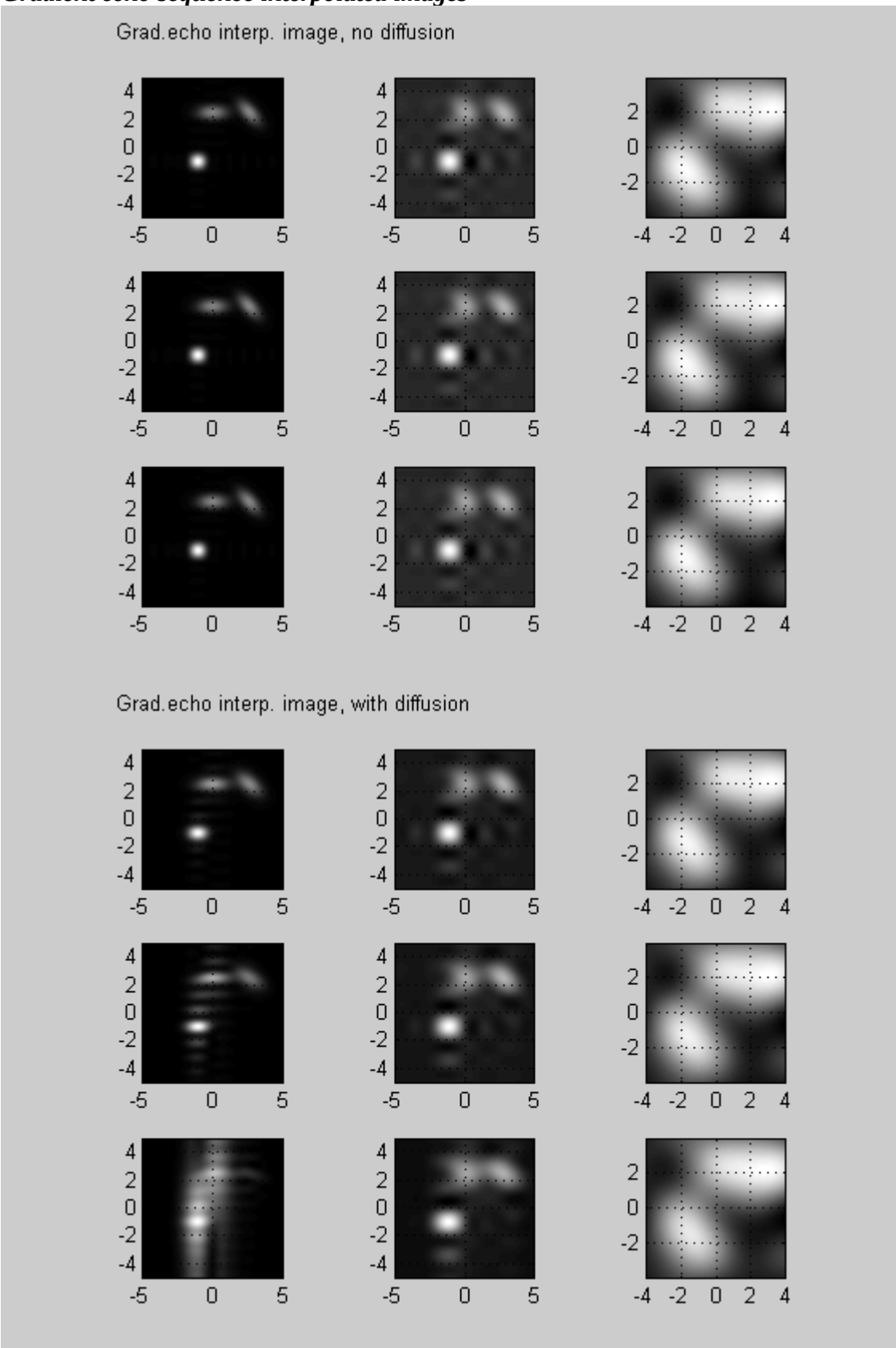
Gradient echo sequence signals



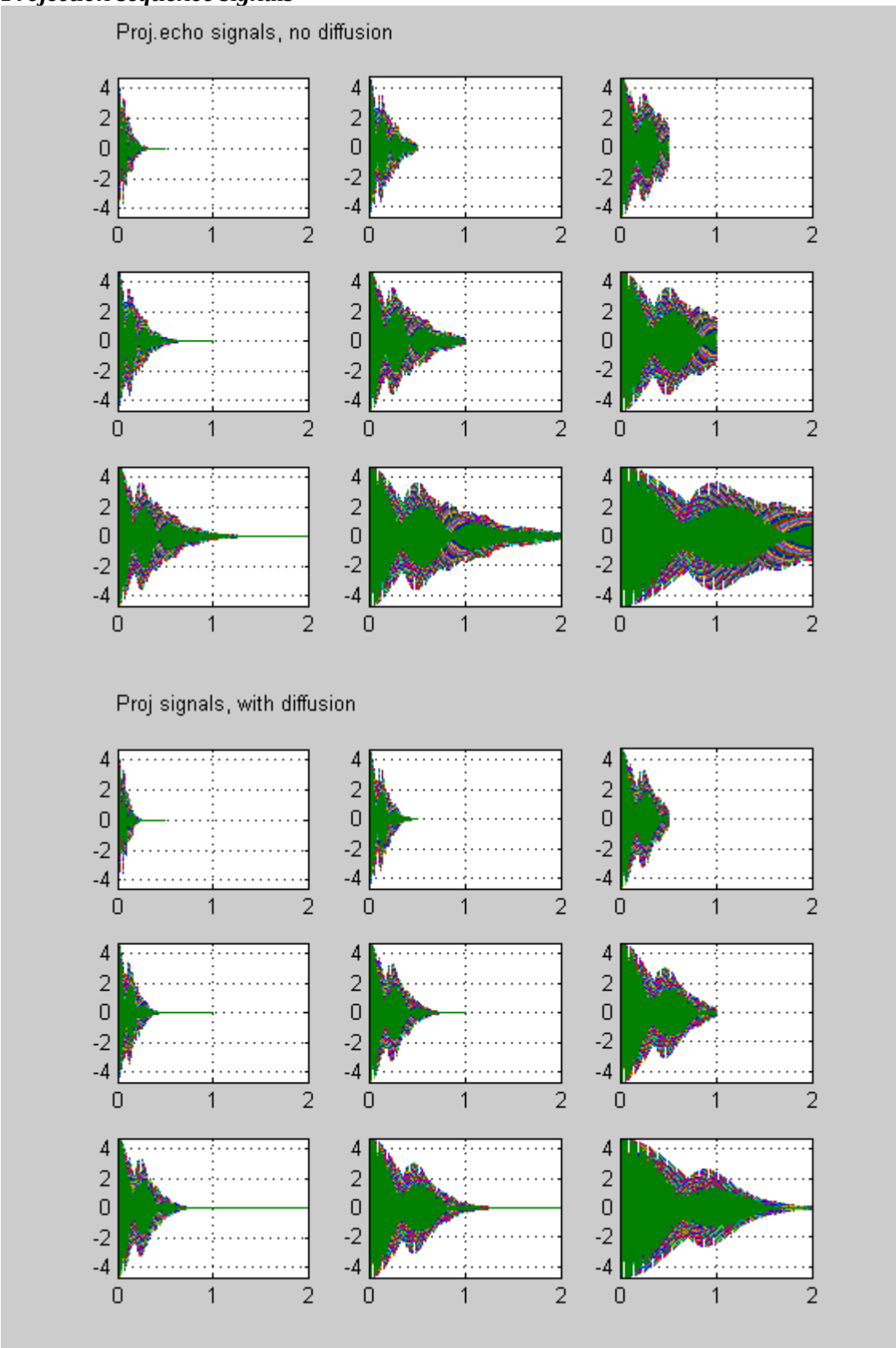
Gradient echo sequence, reconstructed images



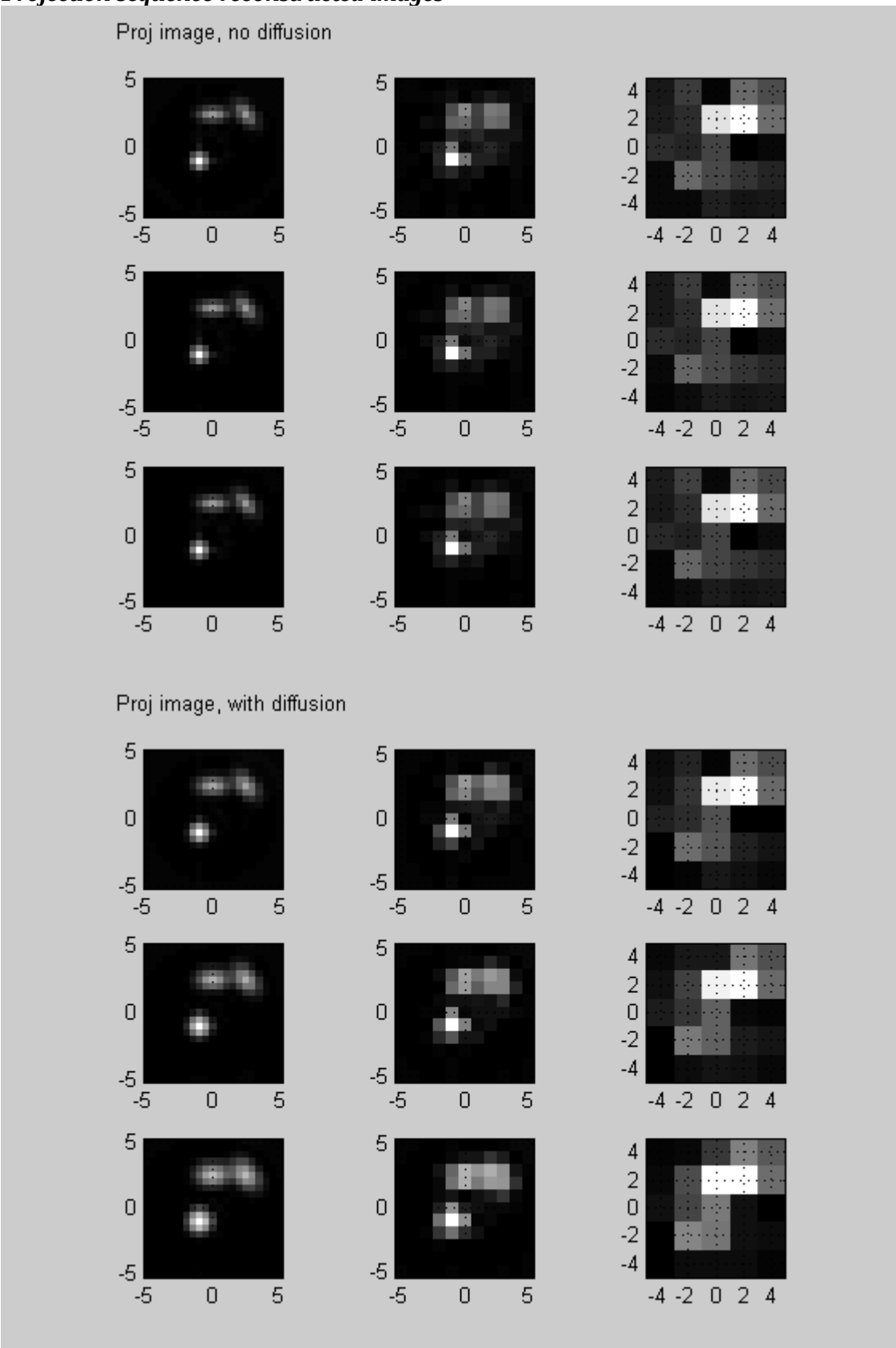
Gradient echo sequence interpolated images



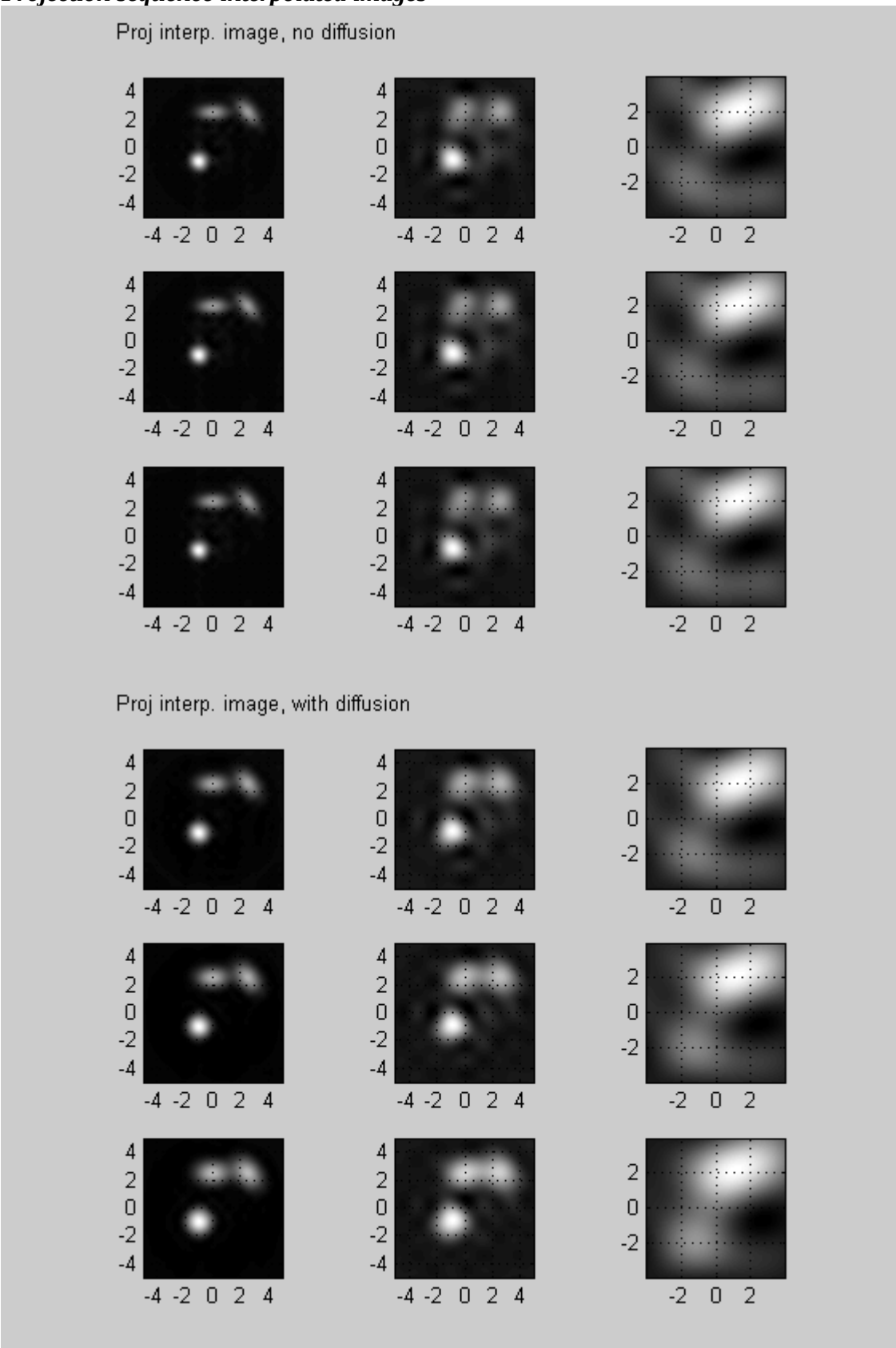
Projection sequence signals



Projection sequence reconstructed images



Projection sequence interpolated images



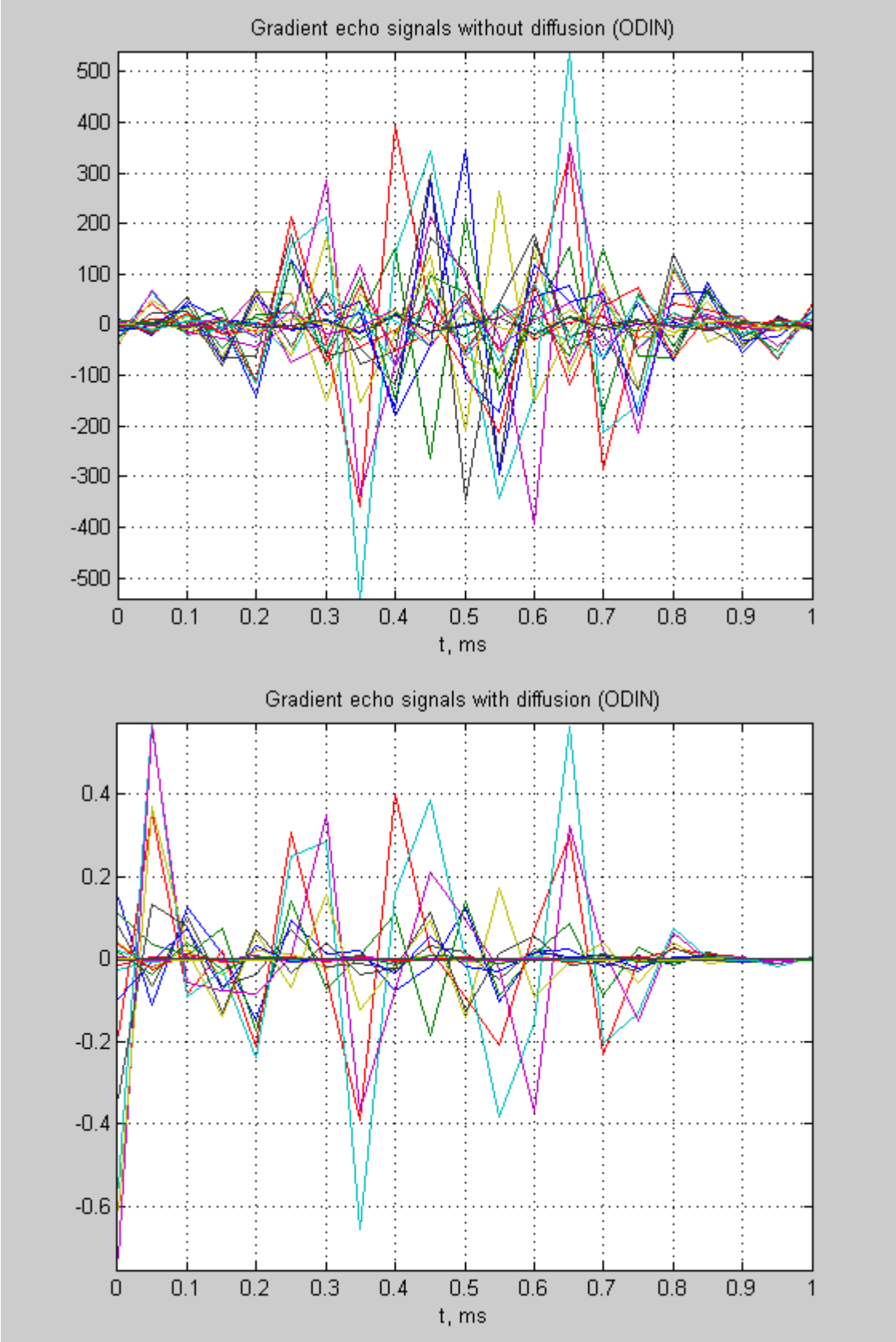
ODIN test calculation

ODIN[2] - Object-Oriented Development Interface for NMR

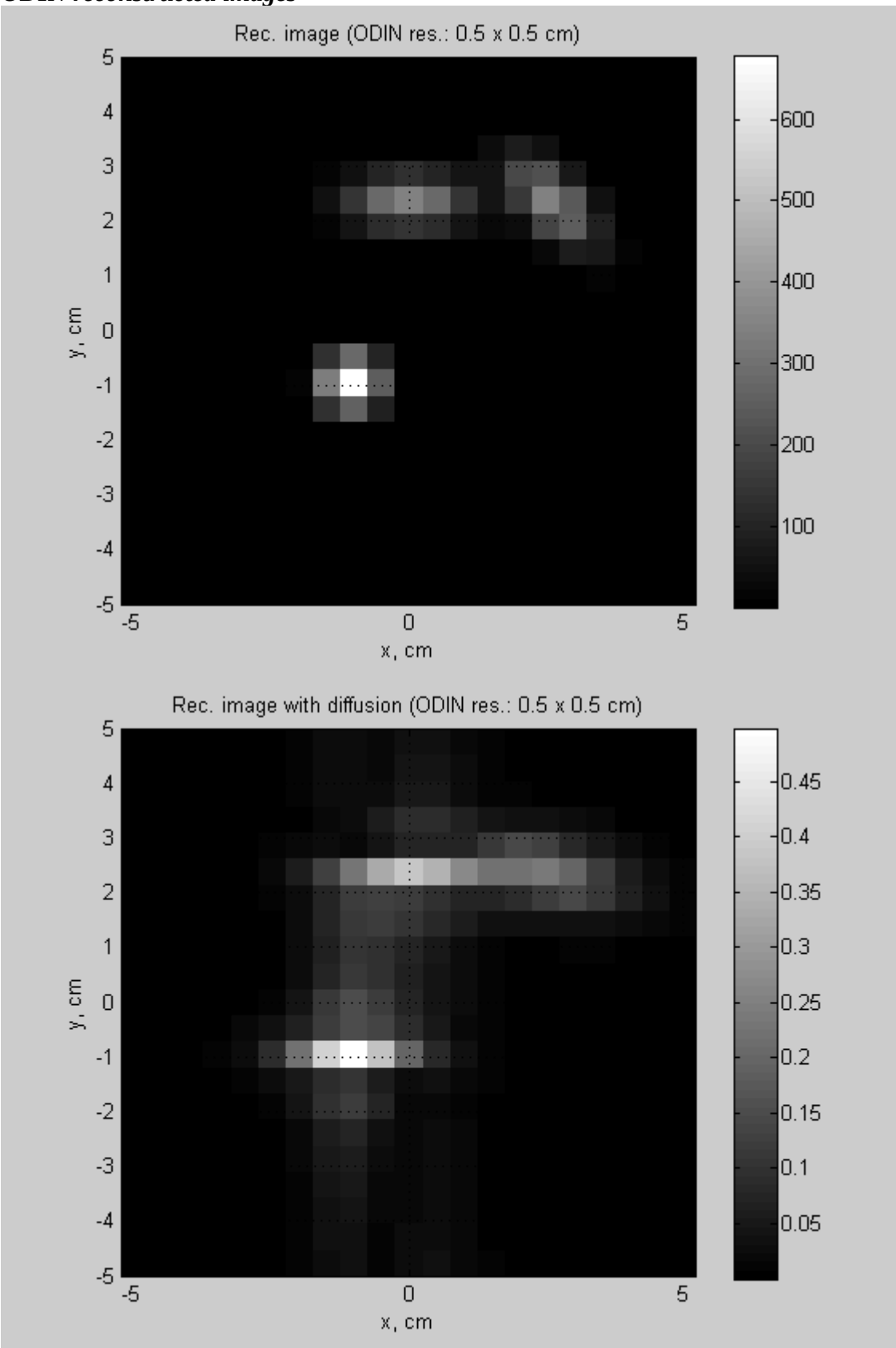
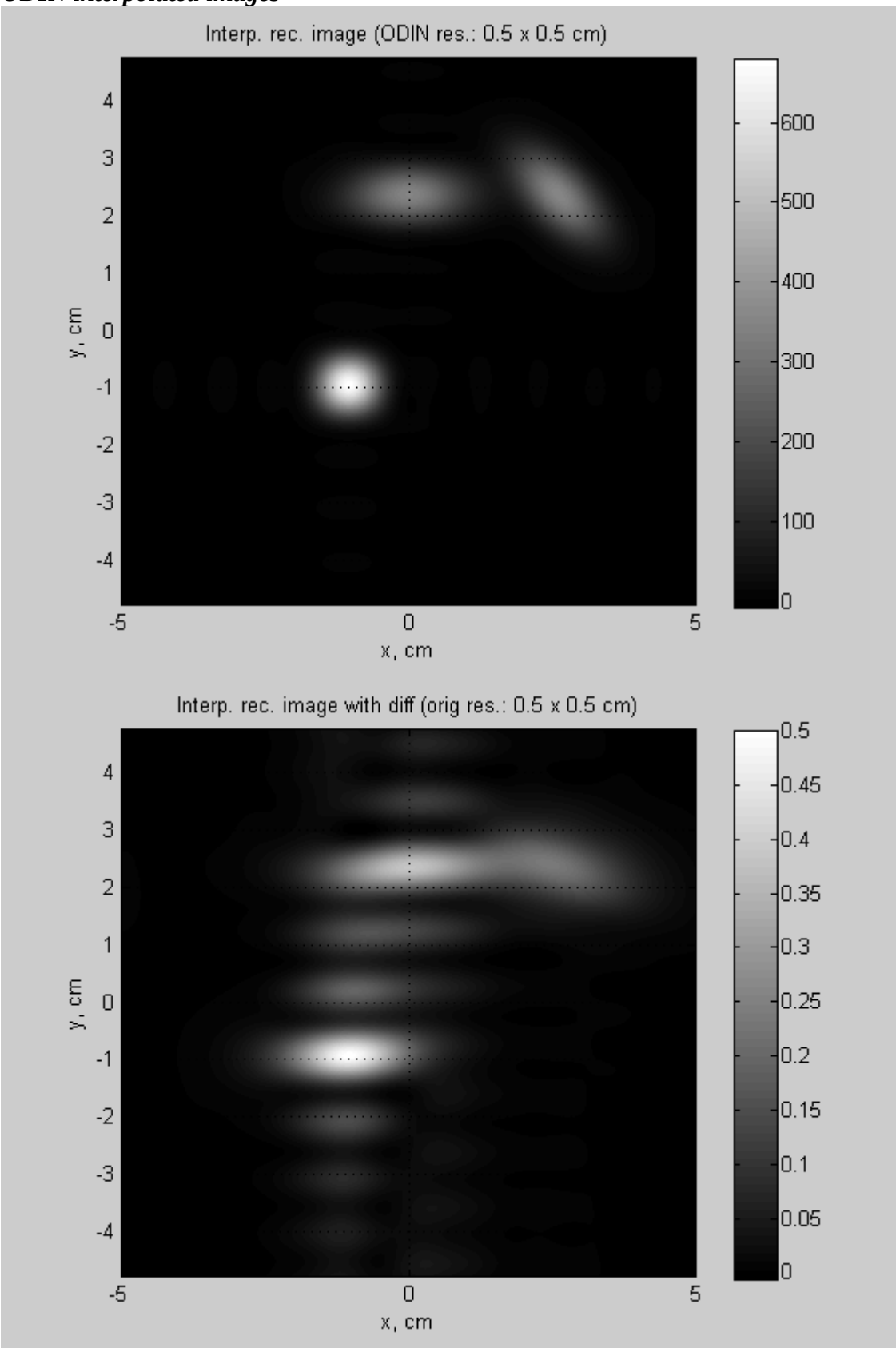
Parameters:
B0, mT: 1.17433
PhaseDuration, ms: 0.5
MaxPhaseGrad, mT/mm: 0.00469732
MatrixSizePhase: 21
MatrixSizeRead: 301
SamplingFrequency, KHz:, 1.000000
ReadDuration, ms: 1
ReadGrad, mT/mm: 0.00469732
PhaseDuration, ms: 0.5
Sample size, mm: 100.00 100.00
T1, ms: 1000.00
T2, ms: 1000.00
Diffusion coeff, mm^2/ms: 50.00

[2] Thies H. Jochimsen, Andreas Schafer, Roland Bammer, Michael E. Moseley Efficient simulation of magnetic resonance imaging with Bloch-Torrey equations using intra-voxel magnetization gradients, Journal of Magnetic Resonance 180 (2006) 29-38

ODIN signals



ODIN reconstructed images



ODIN interpolated images