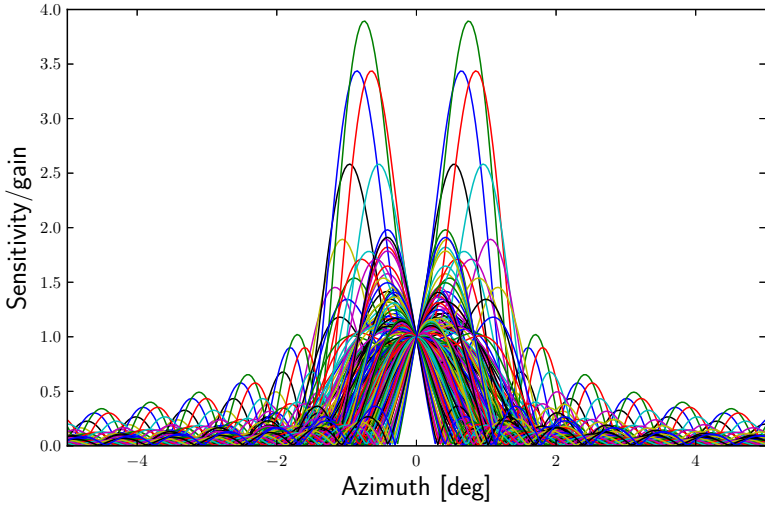
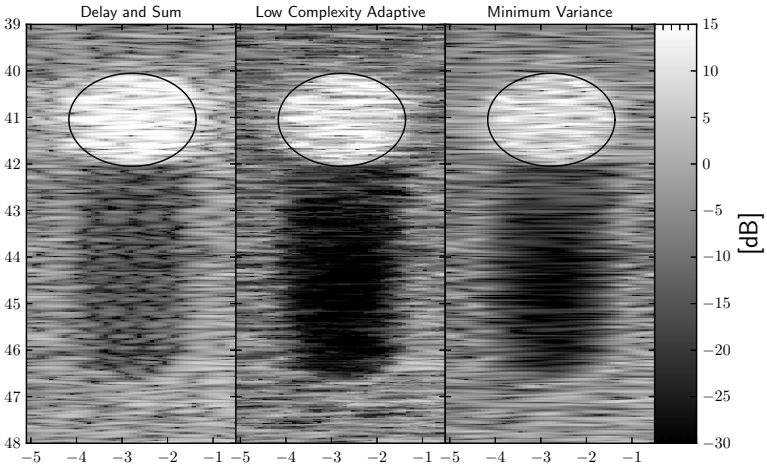
LCA with trigonometric and Kaiser windows - Capon shining

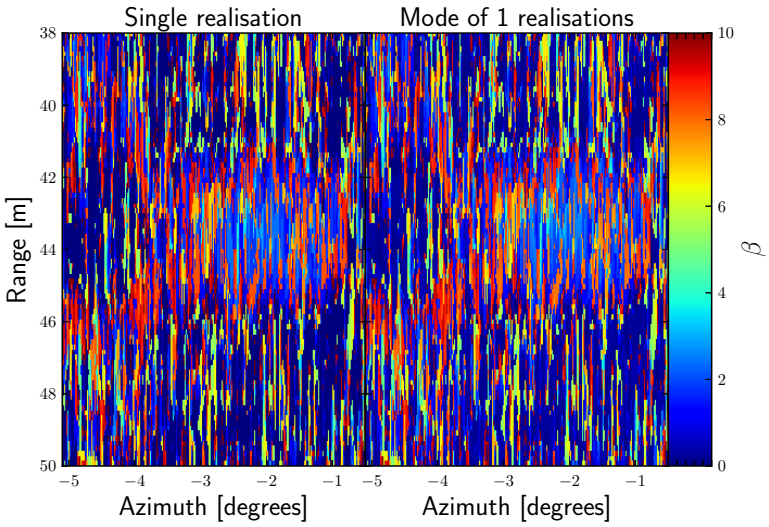
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.01	L = 16	Navg = 3



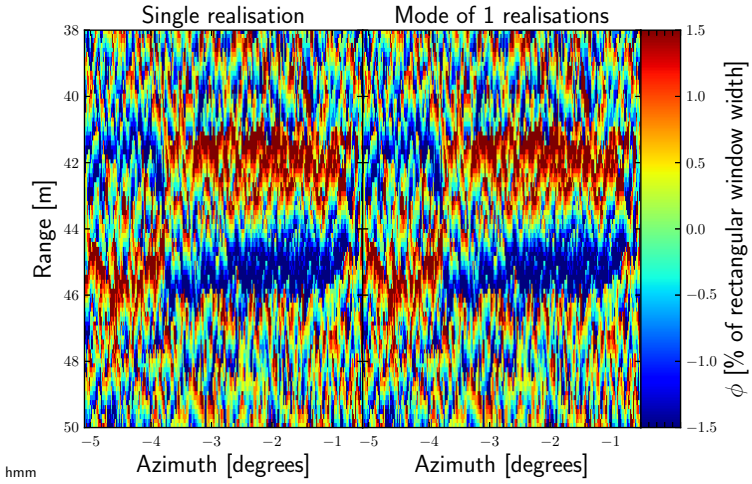
(a) LCA Window Response



(b) Mean images

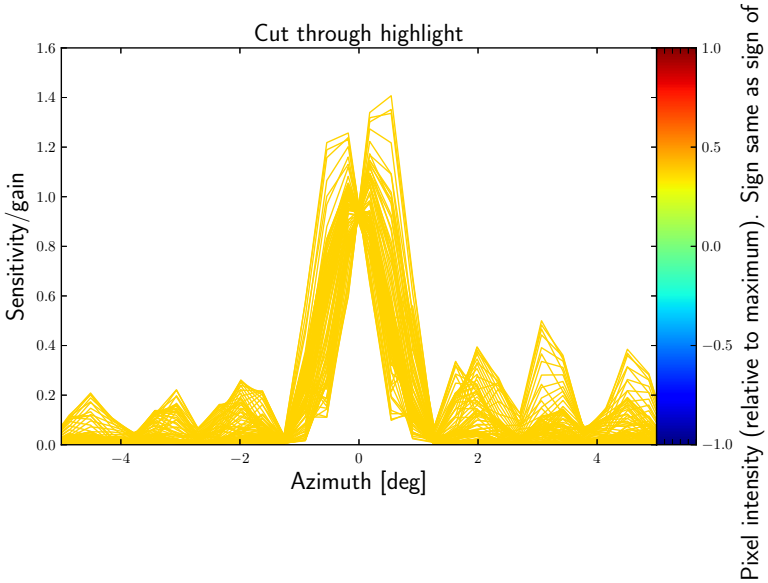


(c) Windows (β)

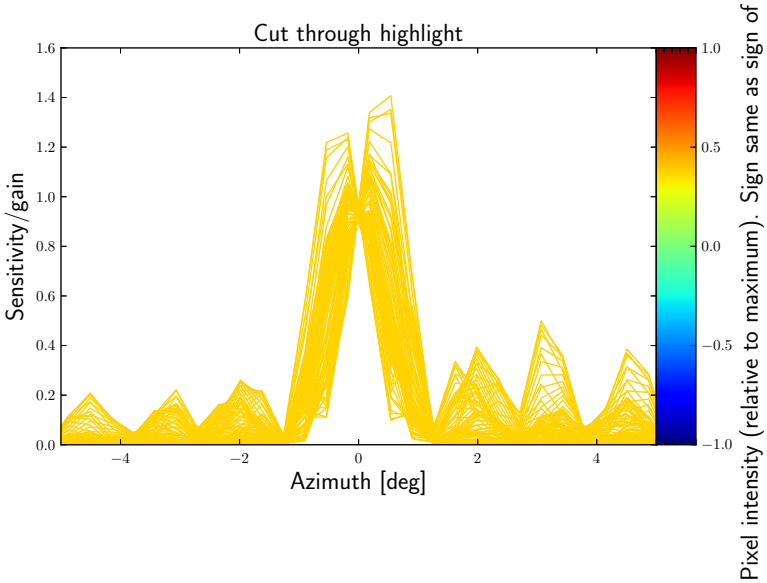


hmm

(d) Windows (ϕ)



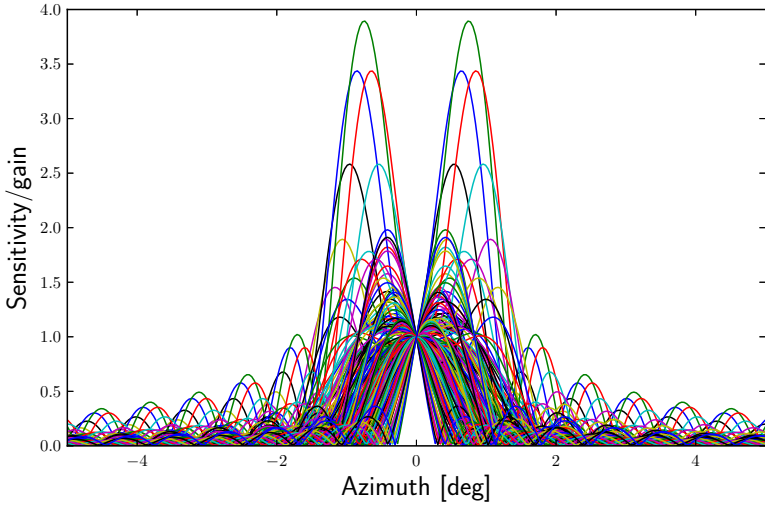
(e) Capon win. resp. through shadow



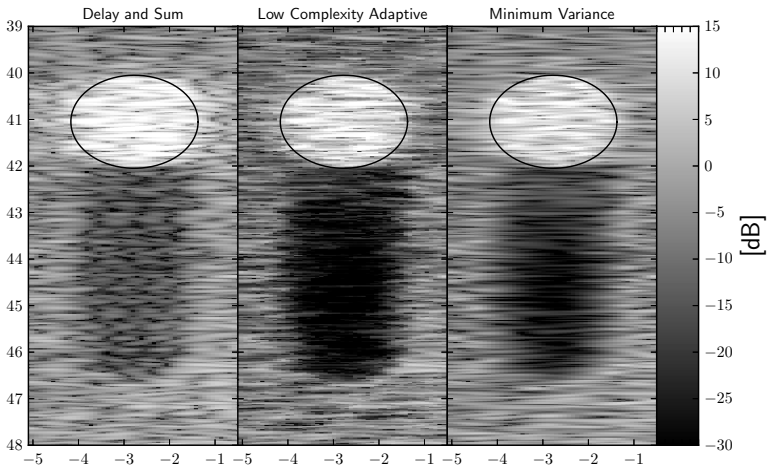
(f) Capon win. resp. through highlight

Capon: Tuning regularisation.

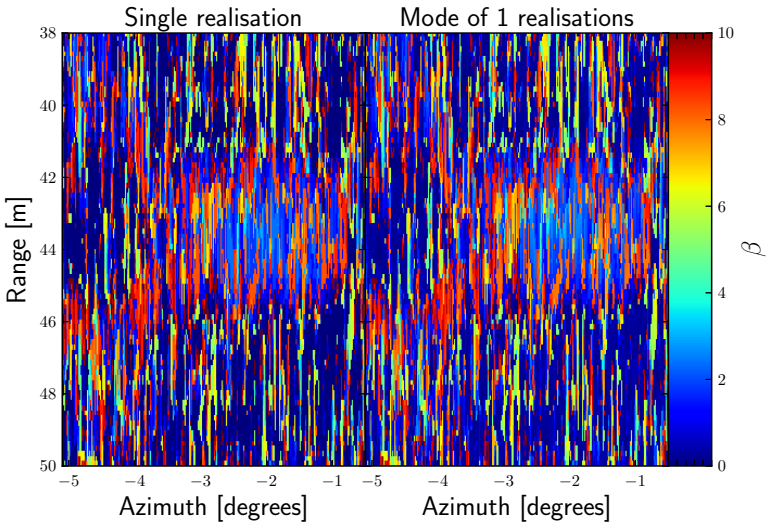
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.05	L = 16	Navg = 3



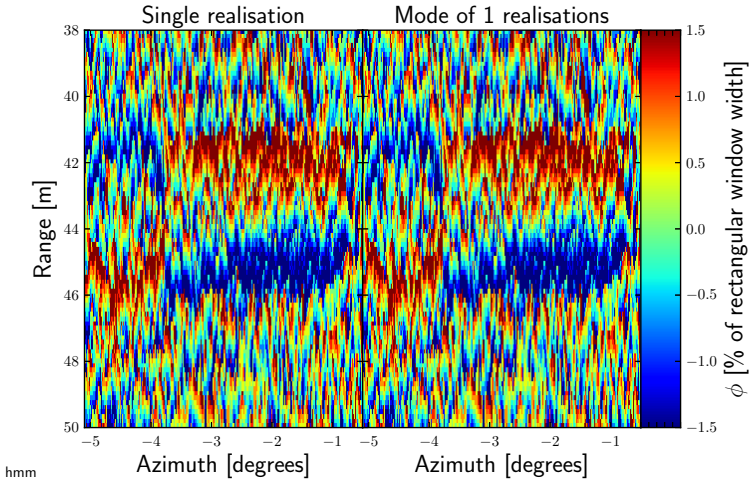
(a) LCA Window Response



(b) Mean images

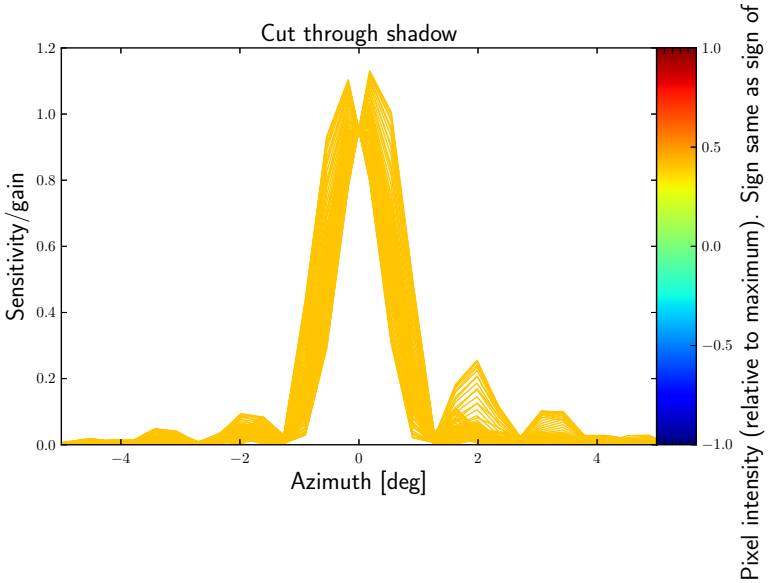


(c) Windows (β)

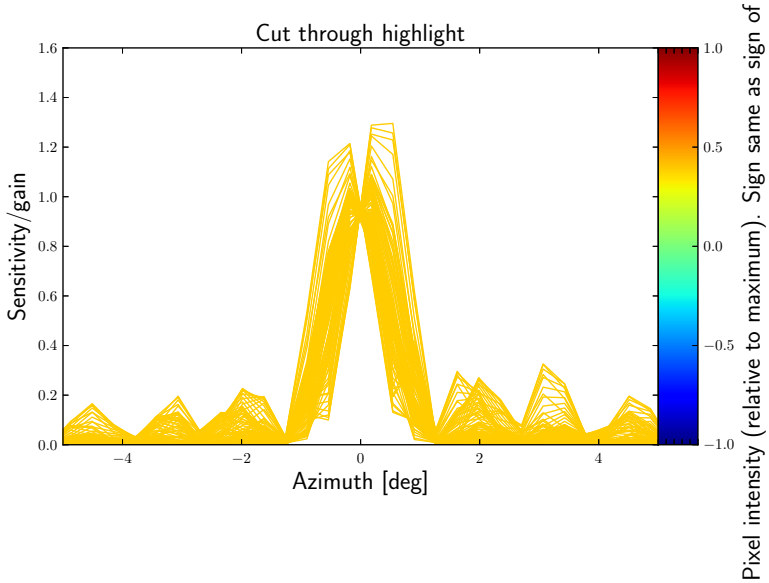


hmm

(d) Windows (ϕ)



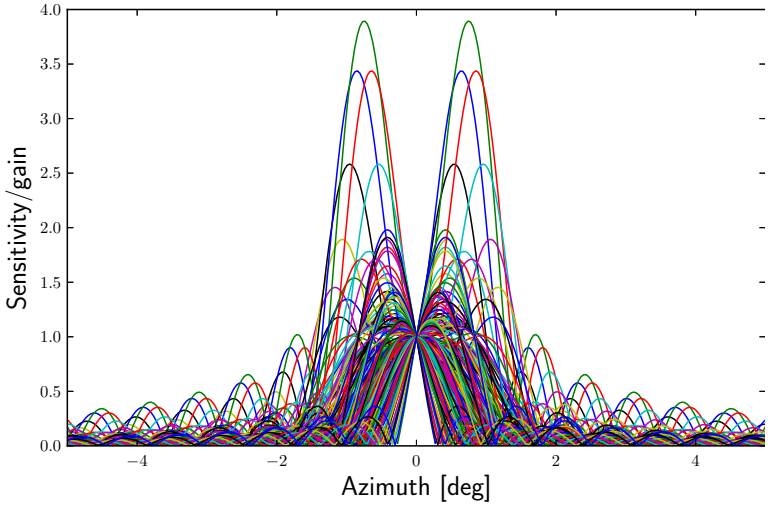
(e) Capon win. resp. through shadow



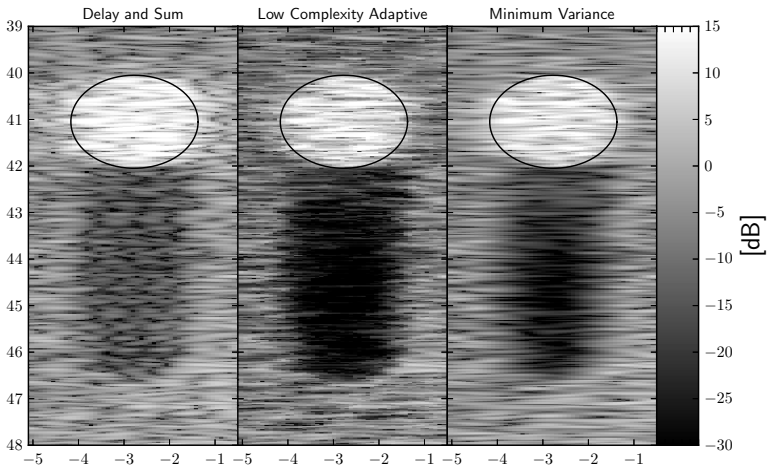
(f) Capon win. resp. through highlight

Capon: Tuning regularisation.

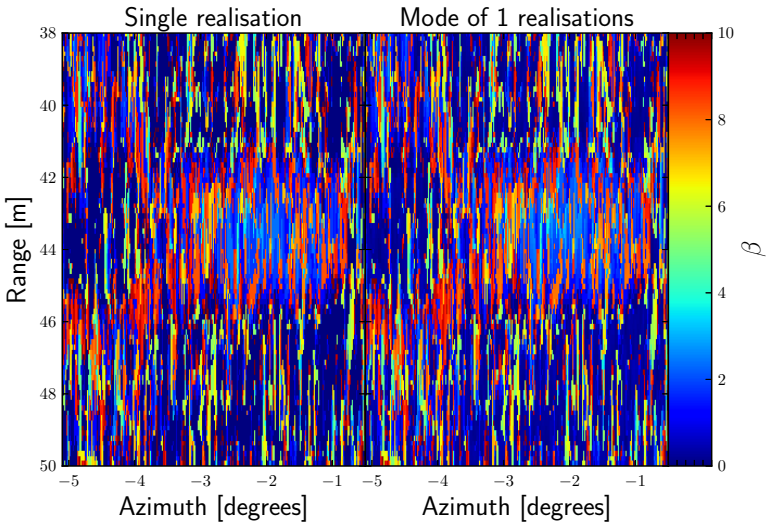
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.20	L = 16	Navg = 3



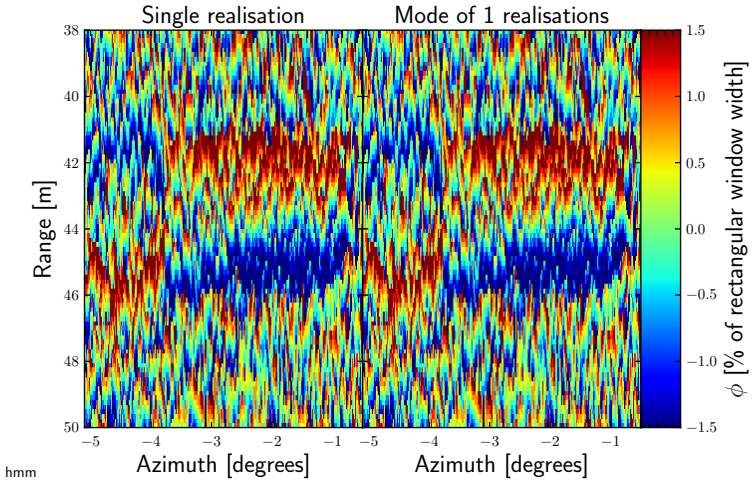
(a) LCA Window Response



(b) Mean images

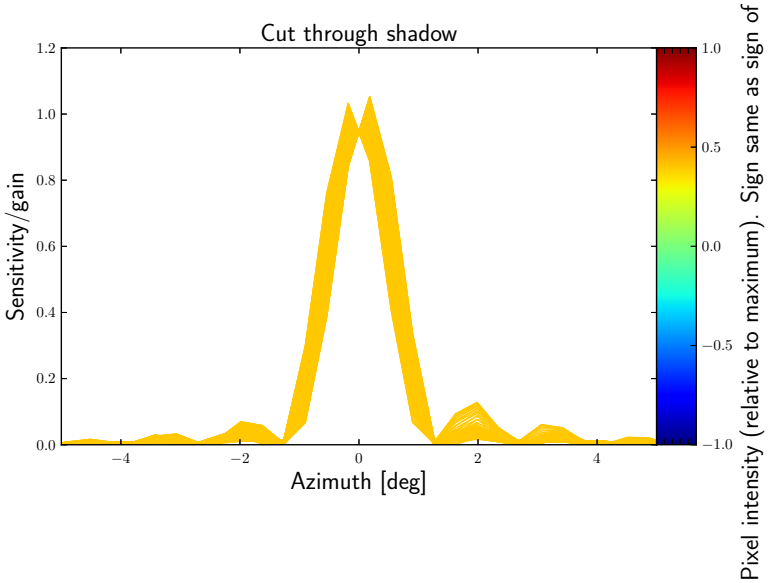


(c) Windows (β)

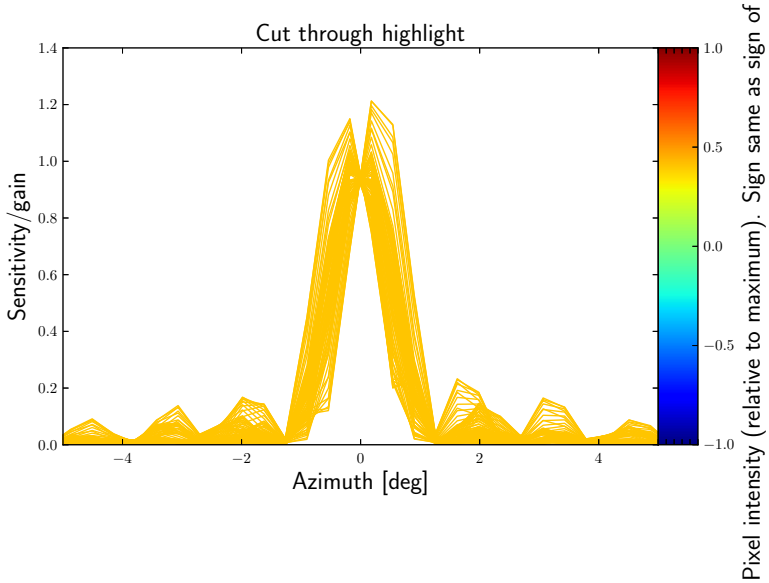


hmm

(d) Windows (ϕ)



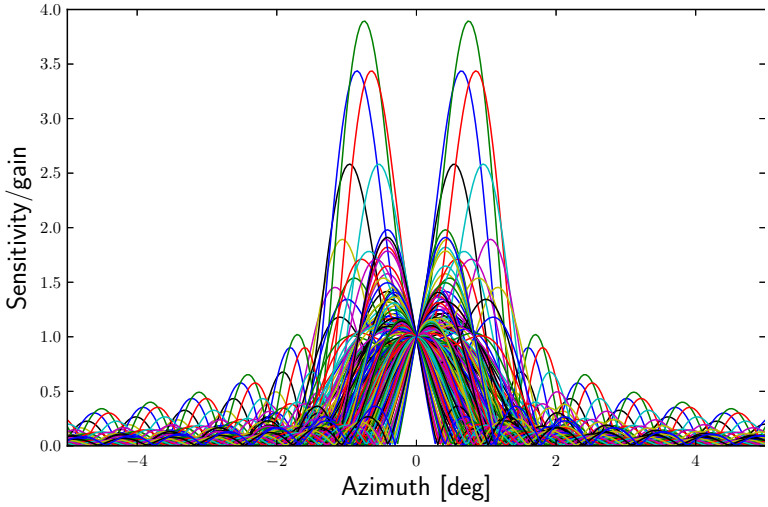
(e) Capon win. resp. through shadow



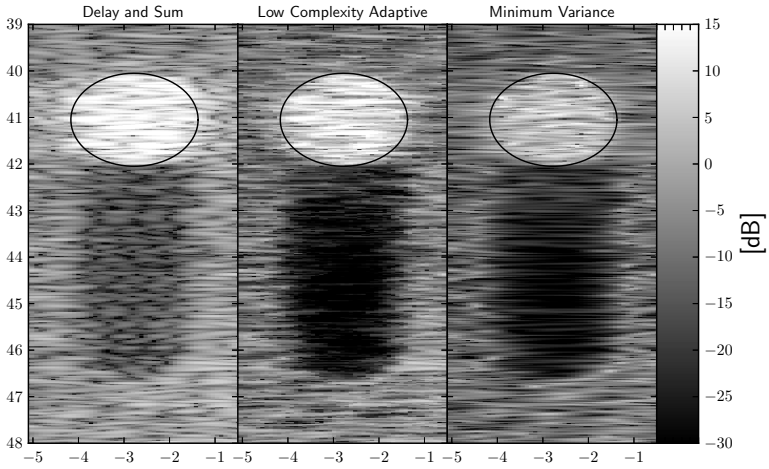
(f) Capon win. resp. through highlight

Capon: Tuning subarray.

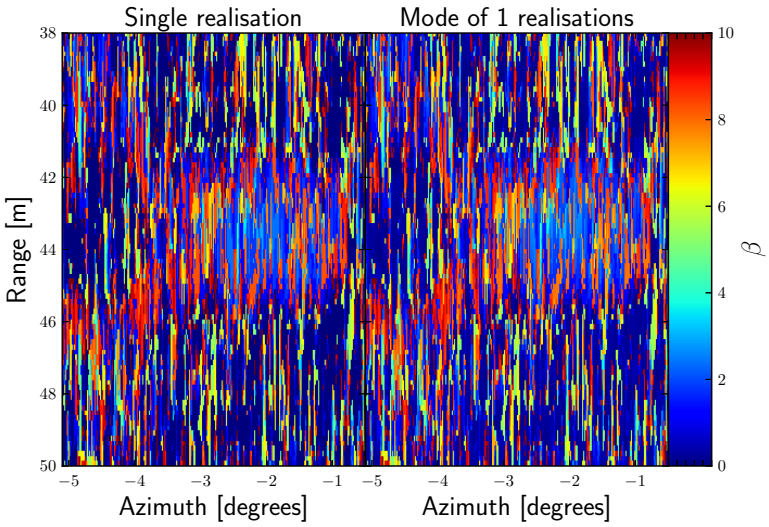
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.01	L = 20	Navg = 3



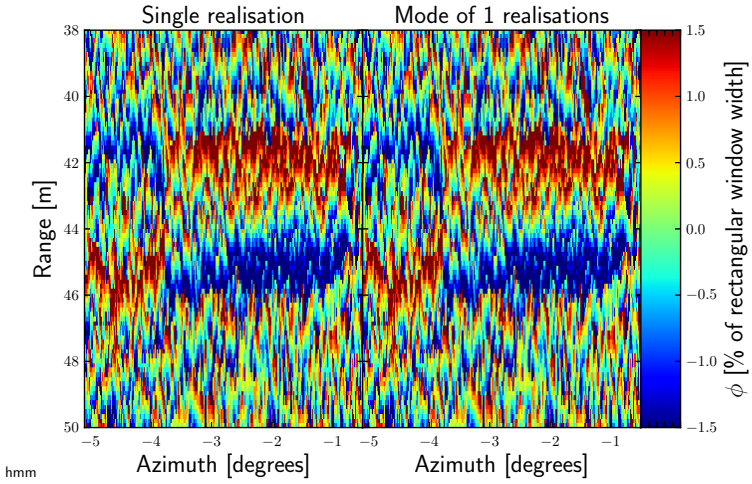
(a) LCA Window Response



(b) Mean images

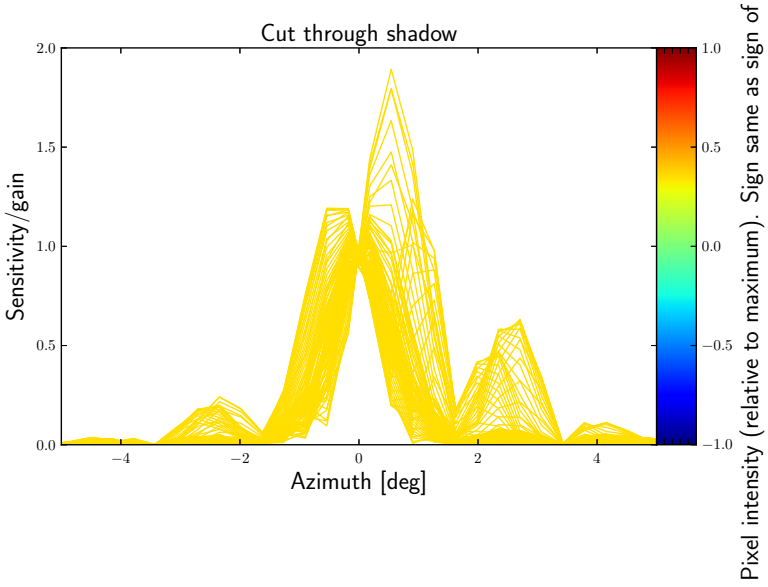


(c) Windows (β)

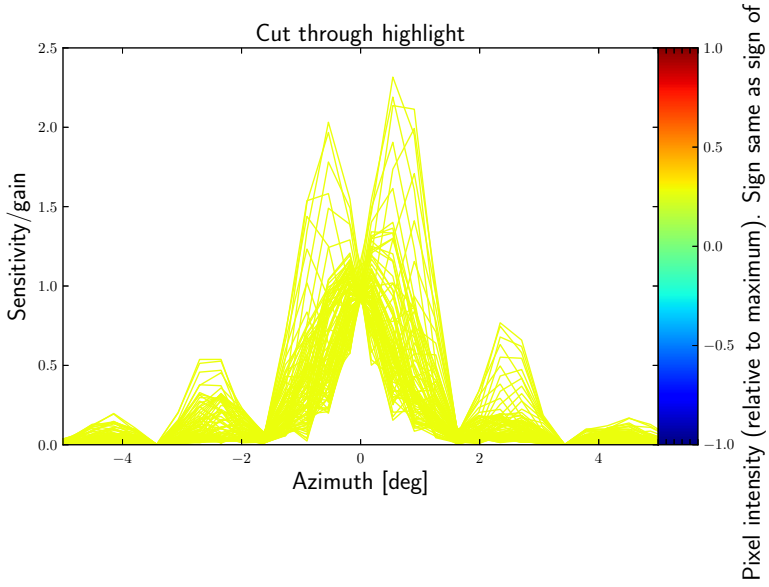


hmm

(d) Windows (ϕ)



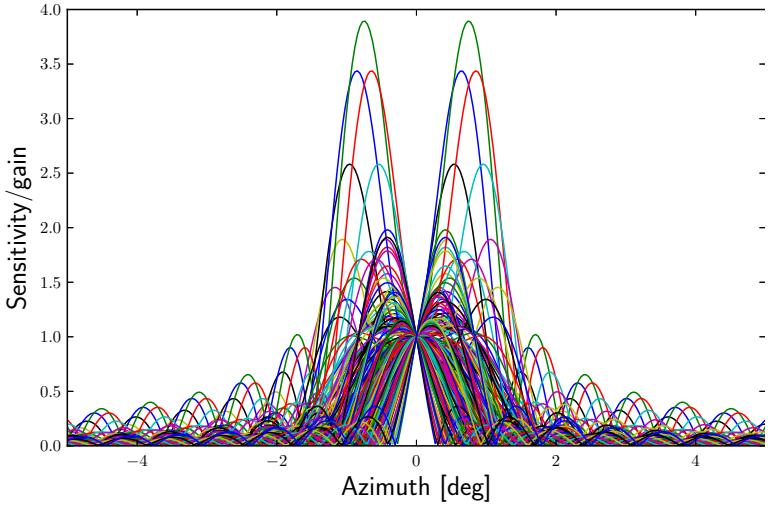
(e) Capon win. resp. through shadow



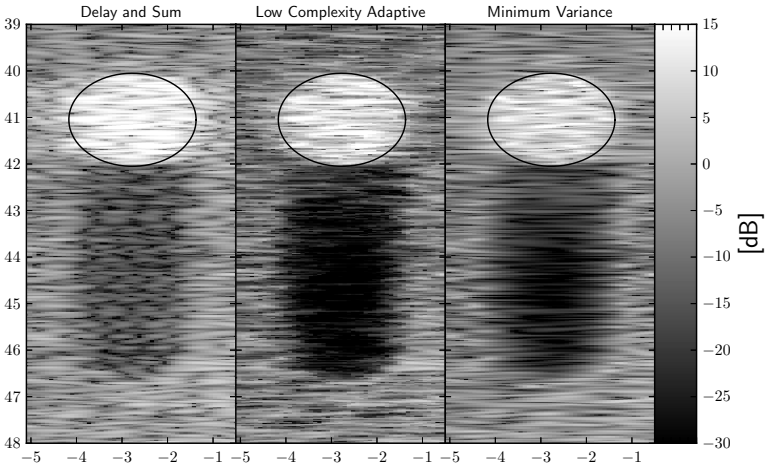
(f) Capon win. resp. through highlight

Capon: Tuning subarray.

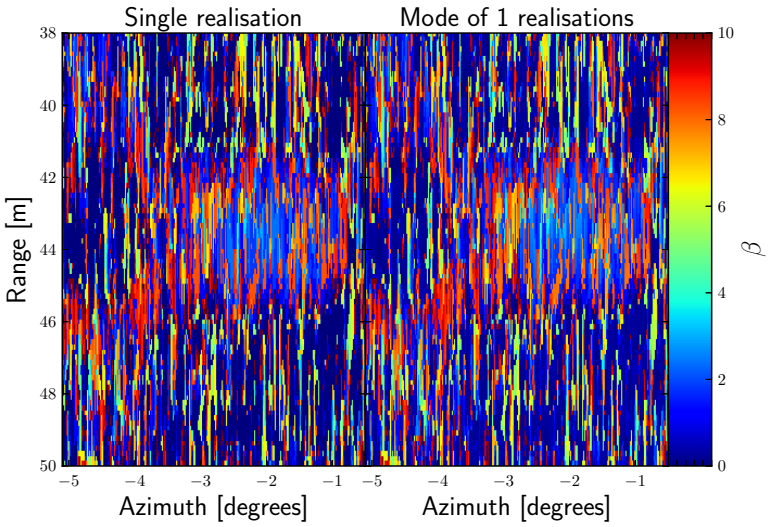
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.01	L = 16	Navg = 3



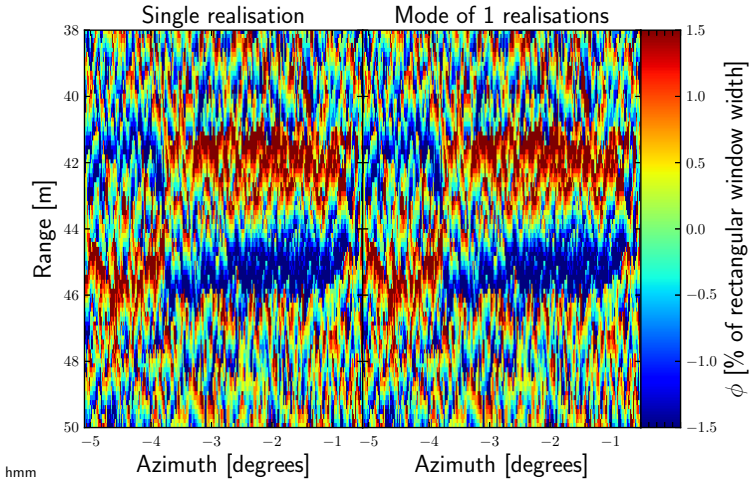
(a) LCA Window Response



(b) Mean images

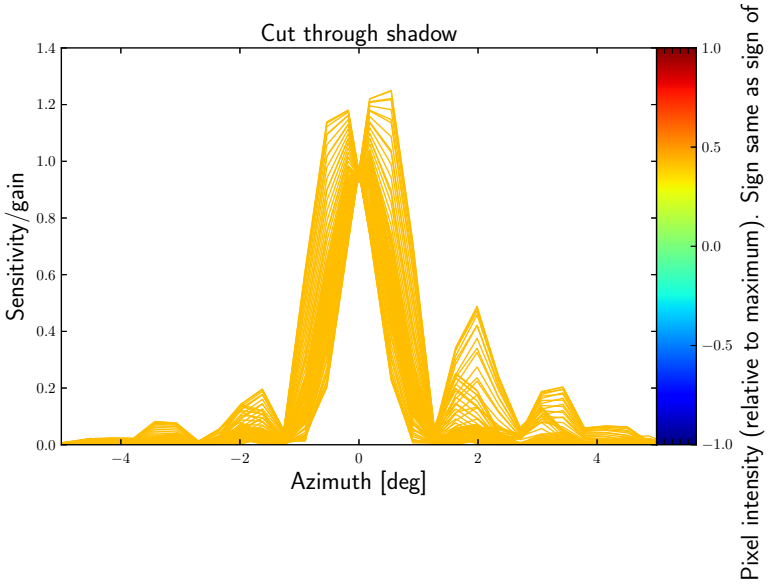


(c) Windows (β)

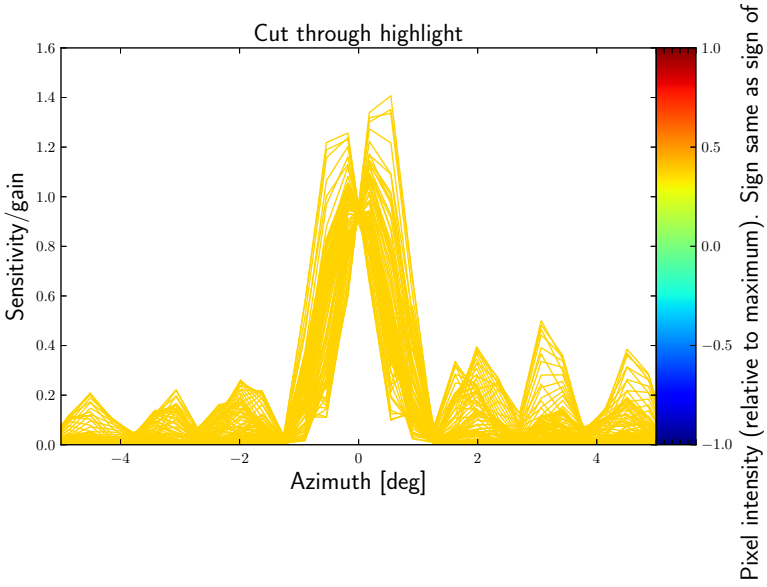


hmm

(d) Windows (ϕ)



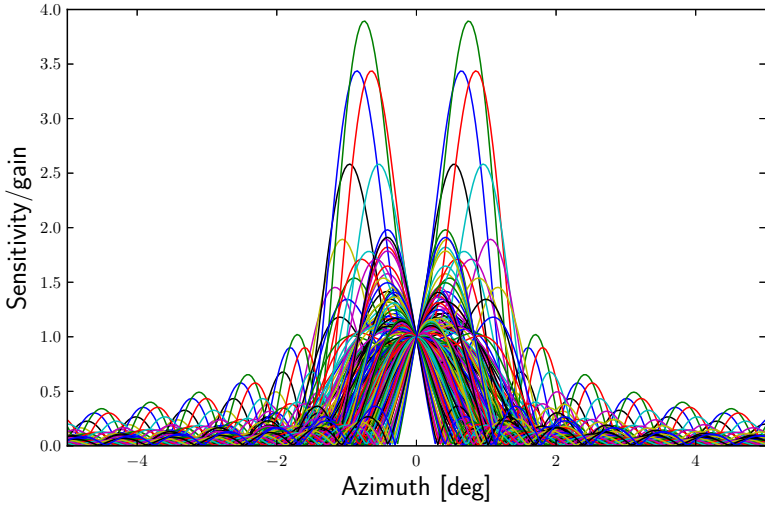
(e) Capon win. resp. through shadow



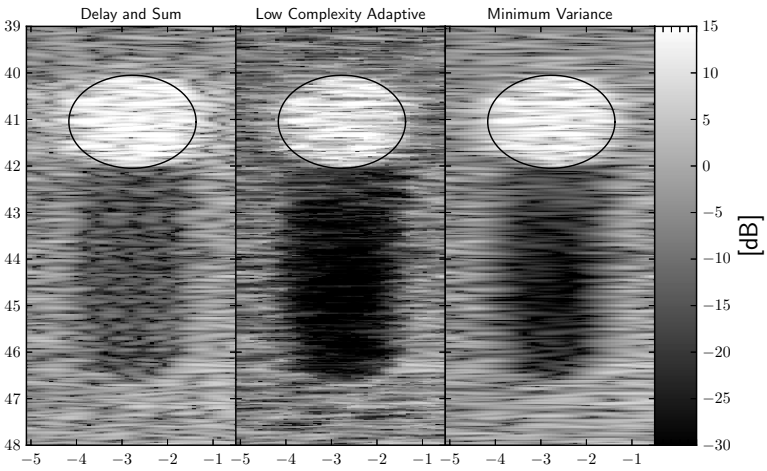
(f) Capon win. resp. through highlight

Capon: Tuning subarray.

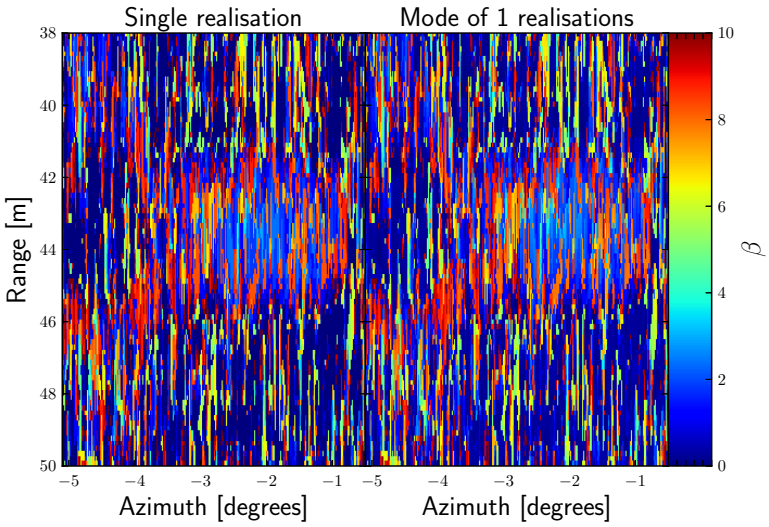
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.01	L = 12	Navg = 3



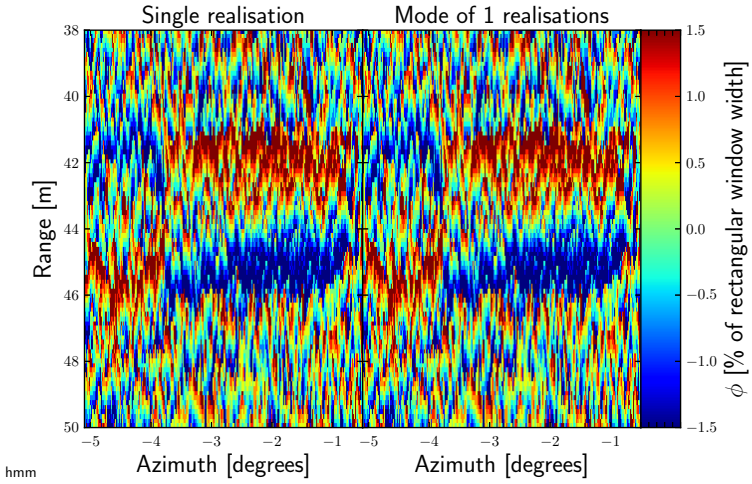
(a) LCA Window Response



(b) Mean images

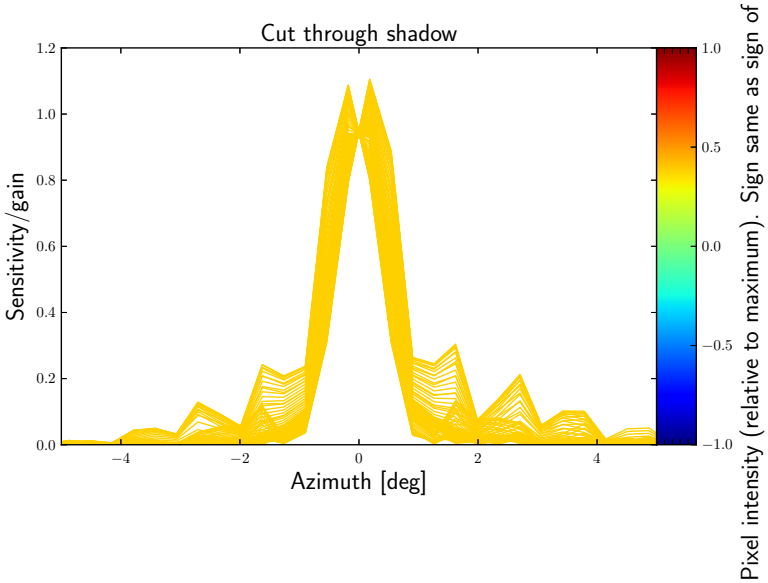


(c) Windows (β)

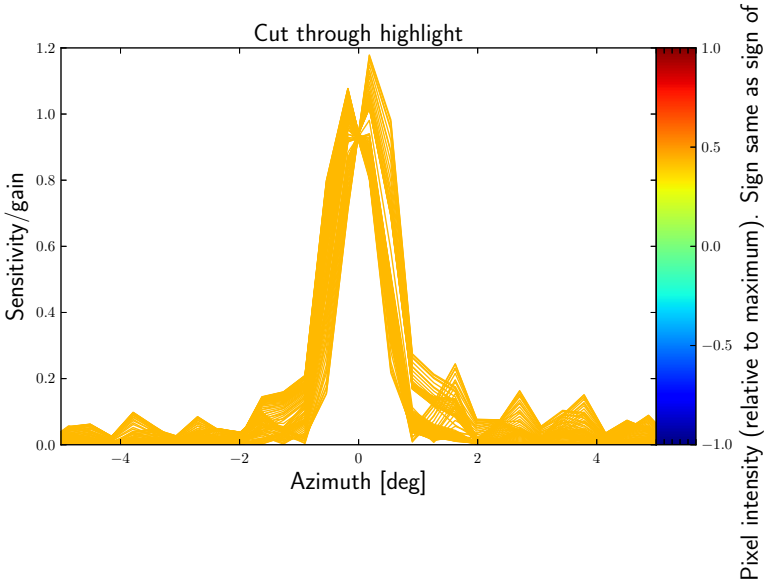


hmm

(d) Windows (ϕ)



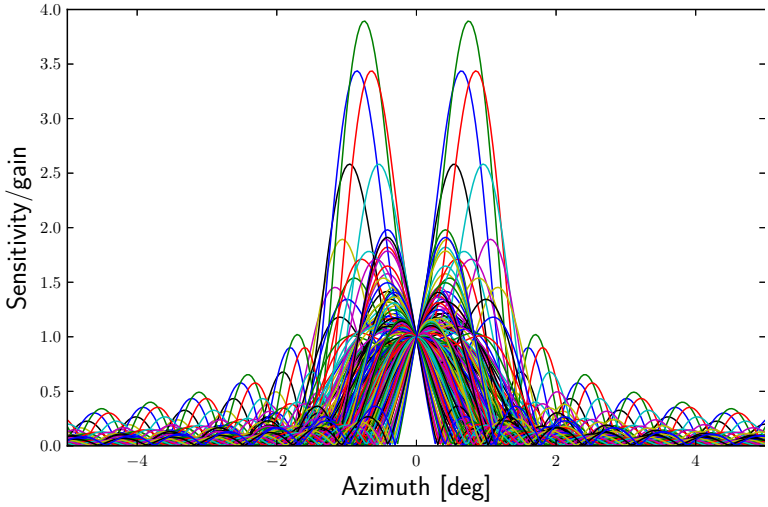
(e) Capon win. resp. through shadow



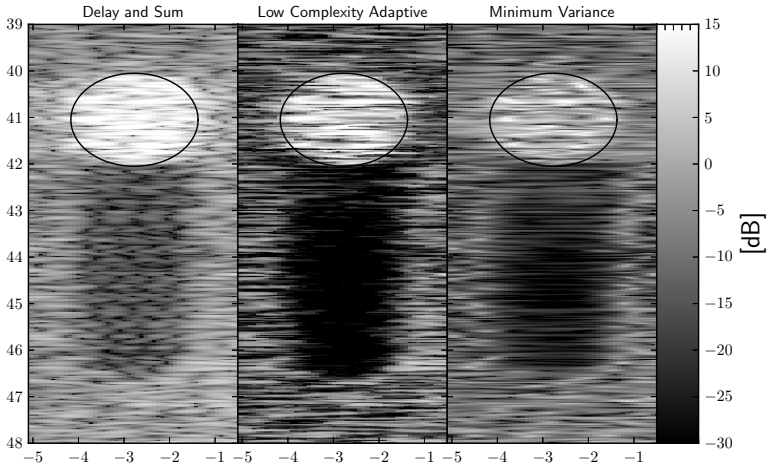
(f) Capon win. resp. through highlight

Capon: Tuning time averaging.

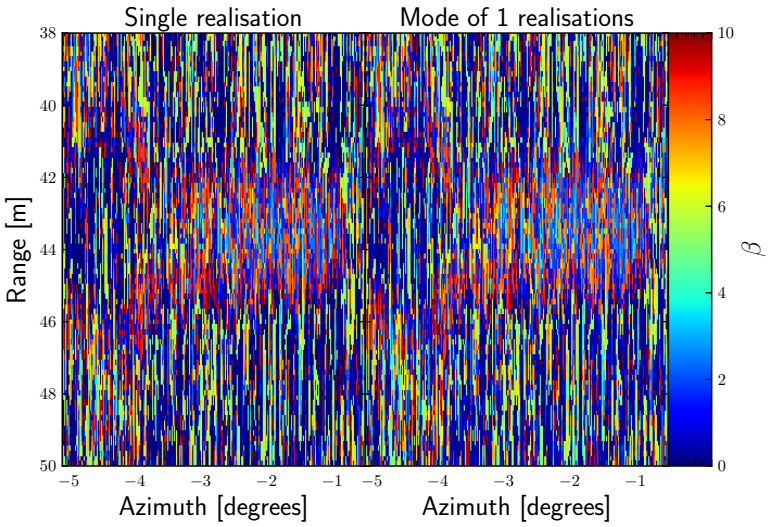
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 1
Capon	Δ = 0.01	L = 16	Navg = 1



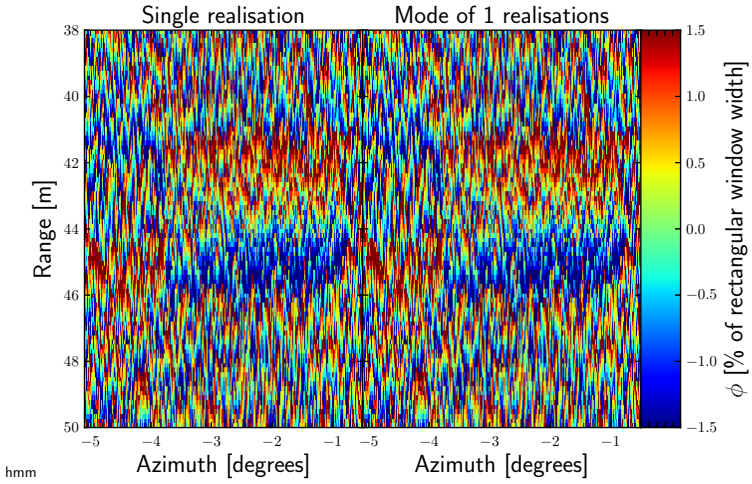
(a) LCA Window Response



(b) Mean images

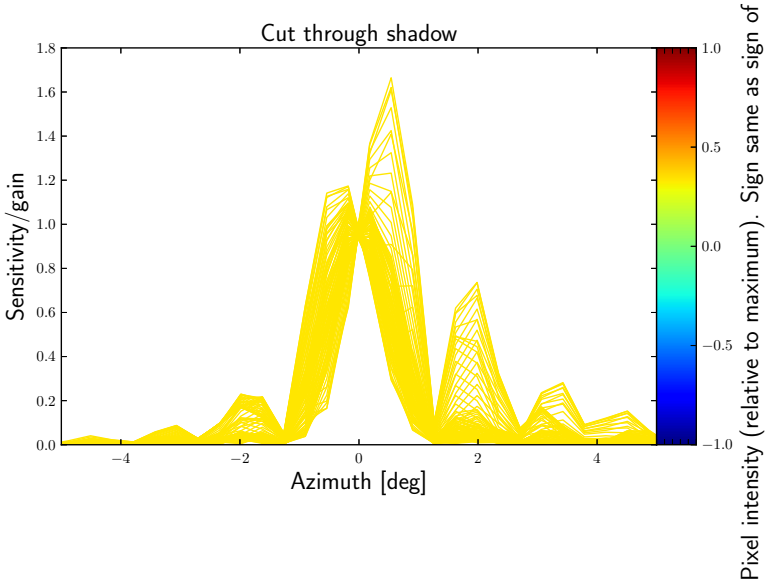


(c) Windows (β)

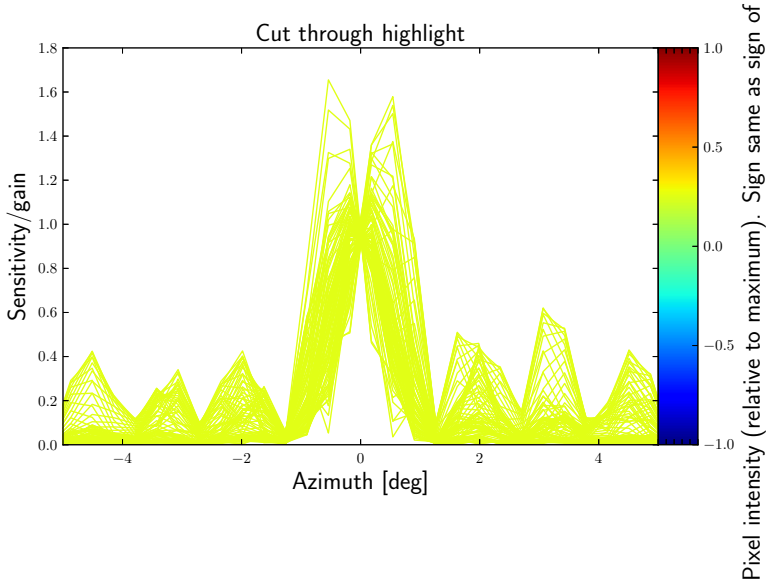


hmm

(d) Windows (ϕ)



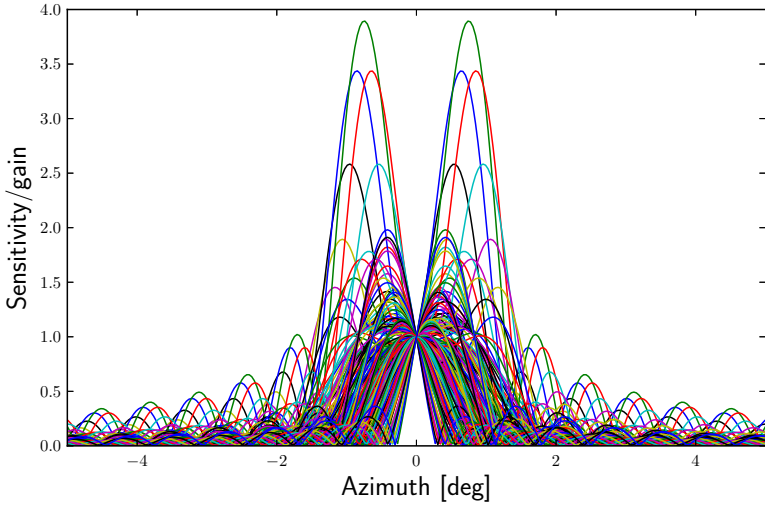
(e) Capon win. resp. through shadow



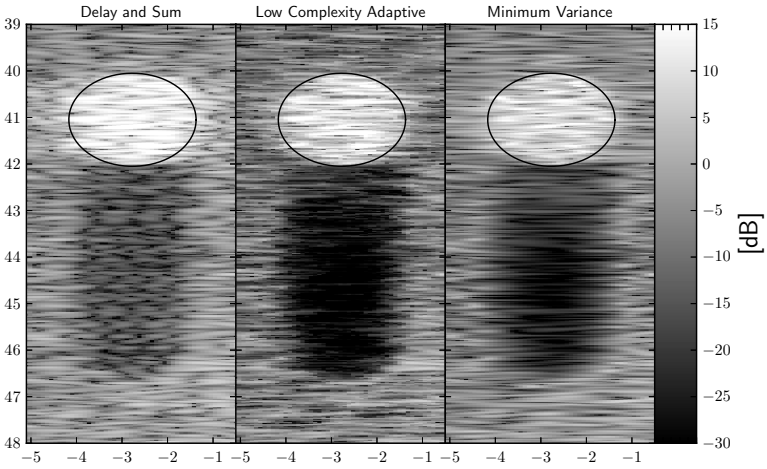
(f) Capon win. resp. through highlight

Capon: Tuning time averaging.

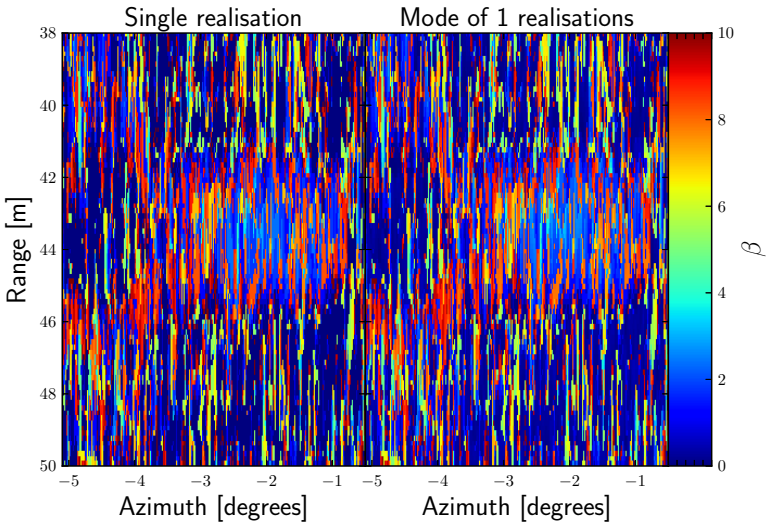
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 3
Capon	Δ = 0.01	L = 16	Navg = 3



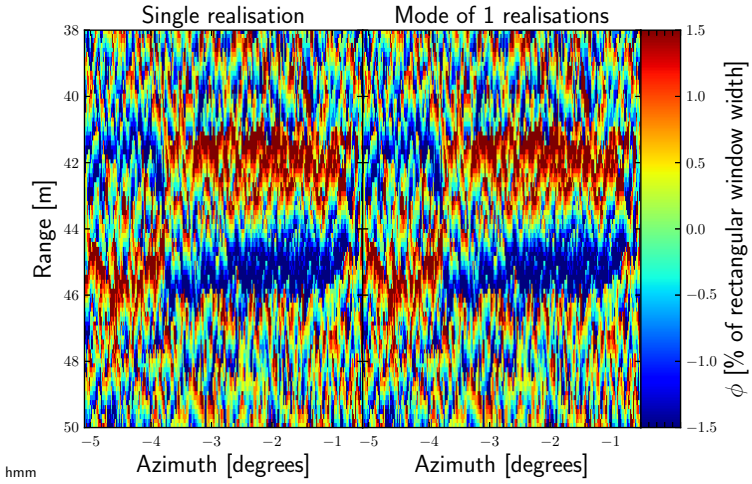
(a) LCA Window Response



(b) Mean images

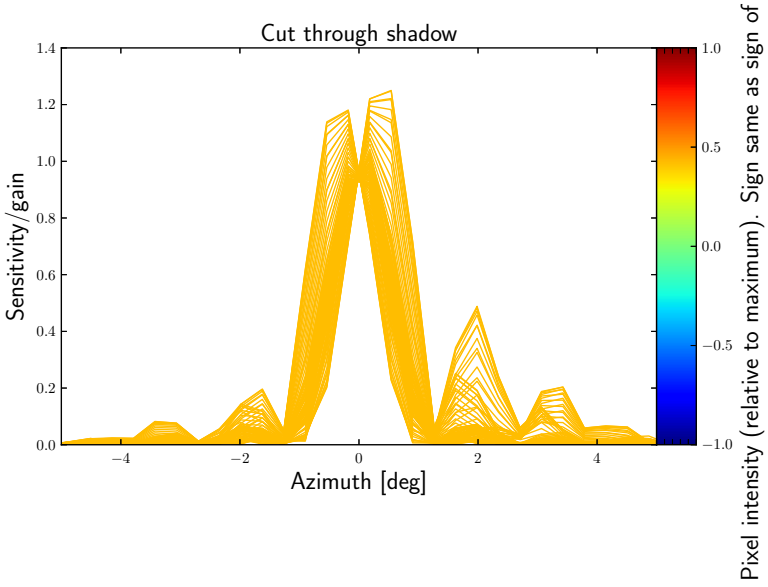


(c) Windows (β)

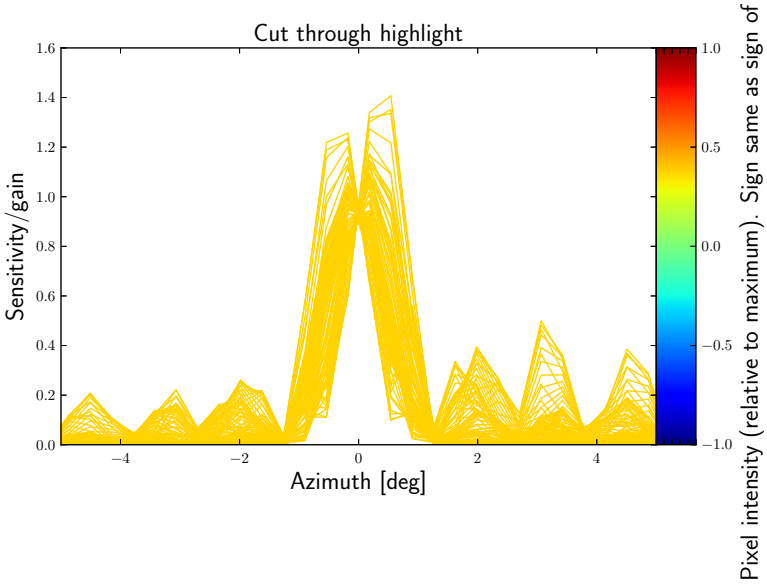


hmm

(d) Windows (ϕ)



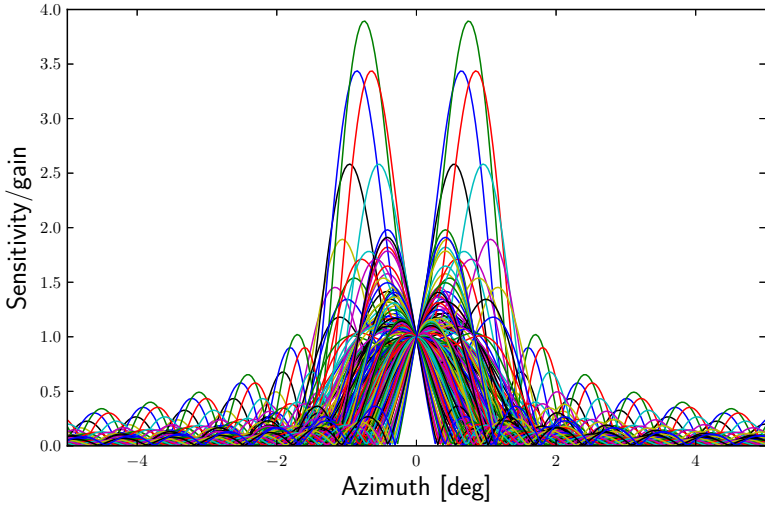
(e) Capon win. resp. through shadow



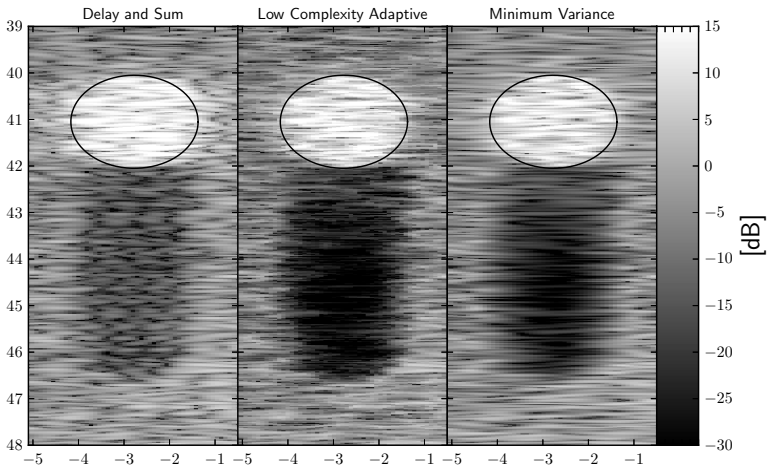
(f) Capon win. resp. through highlight

Capon: Tuning time averaging.

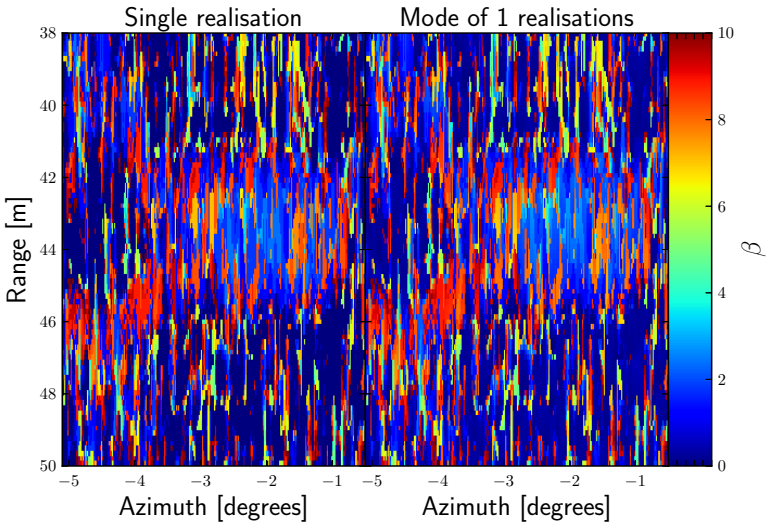
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 5
Capon	Δ = 0.01	L = 16	Navg = 5



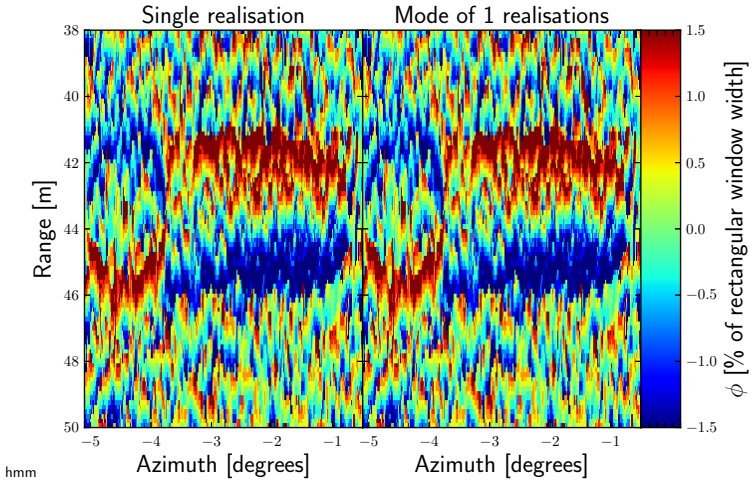
(a) LCA Window Response



(b) Mean images

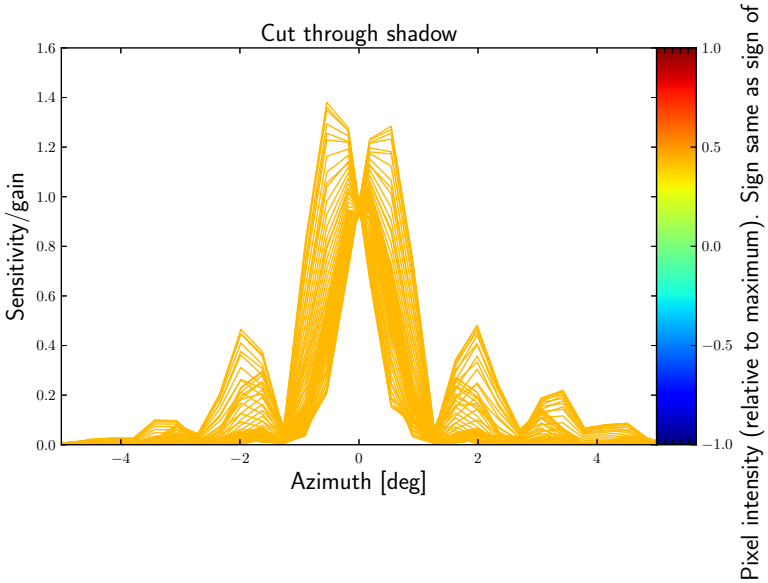


(c) Windows (β)

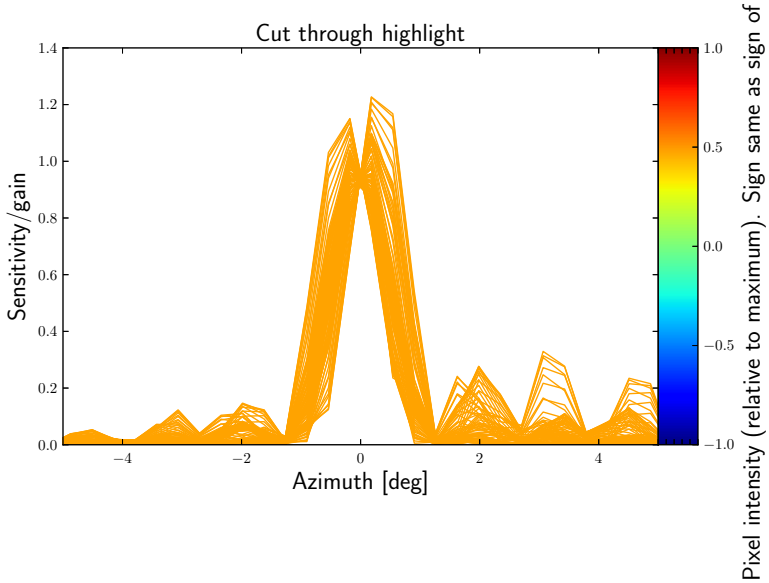


hmm

(d) Windows (ϕ)



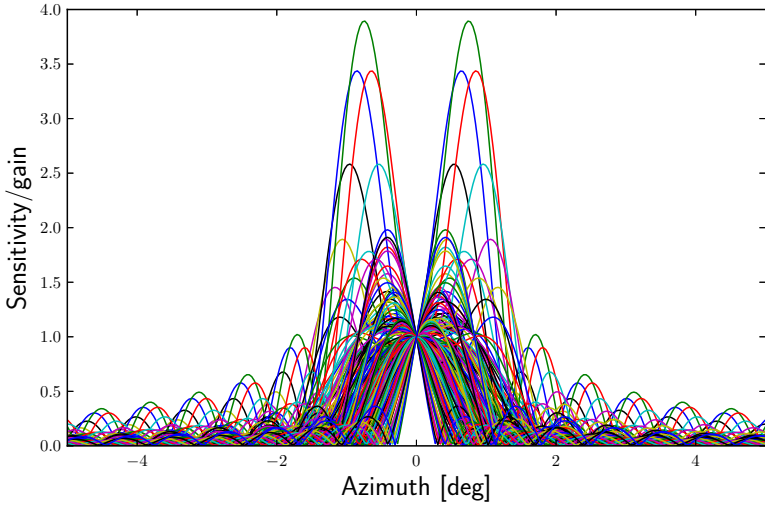
(e) Capon win. resp. through shadow



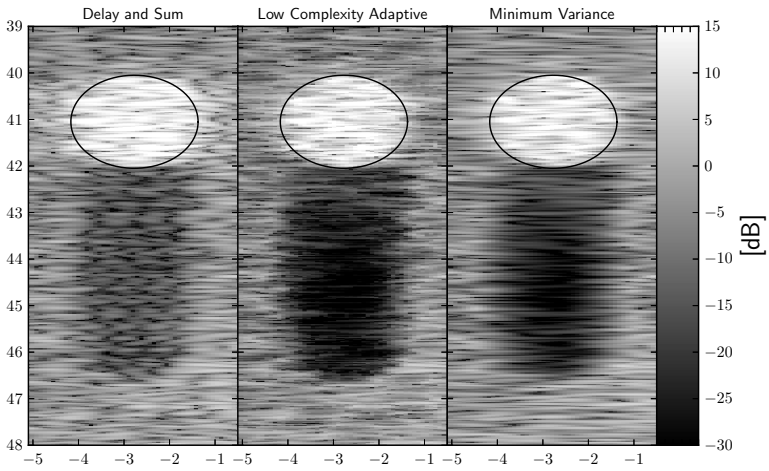
(f) Capon win. resp. through highlight

Capon: Tuning time averaging.

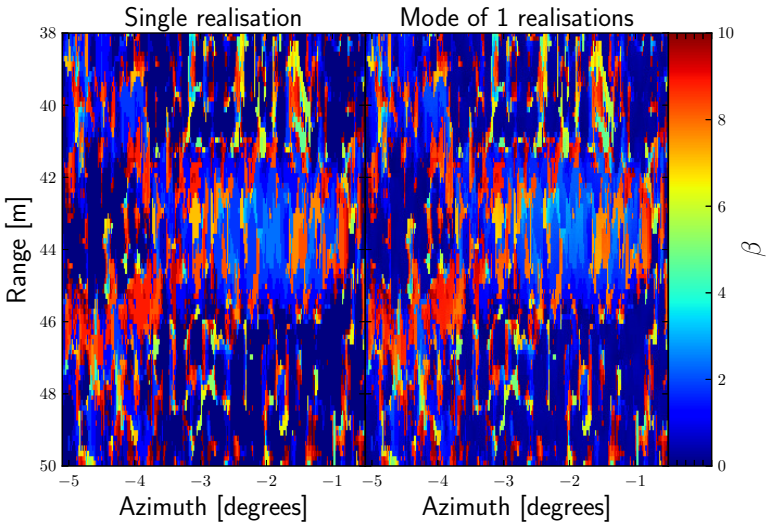
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-1.07, 1.07]$ deg (9 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



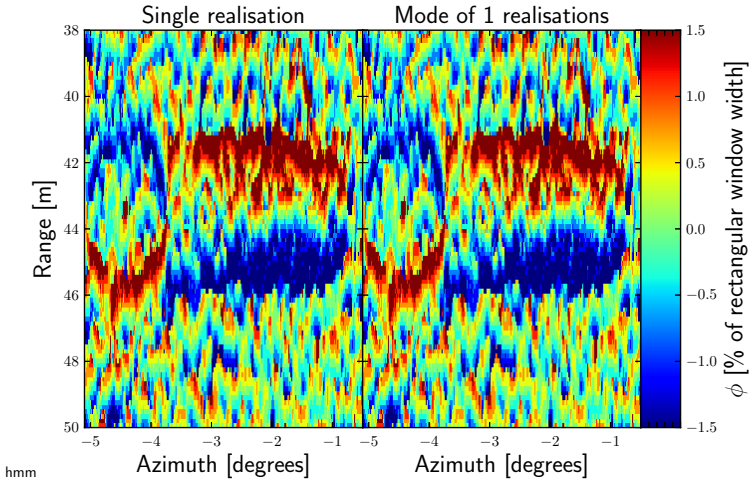
(a) LCA Window Response



(b) Mean images

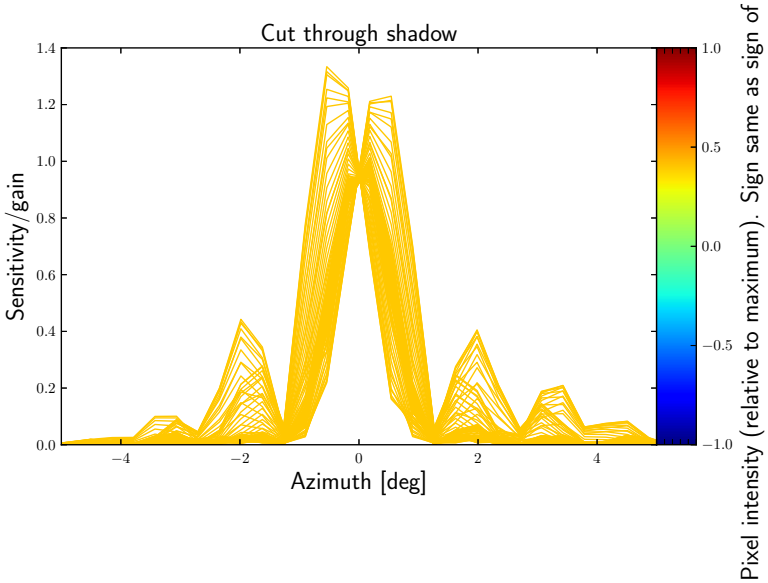


(c) Windows (β)

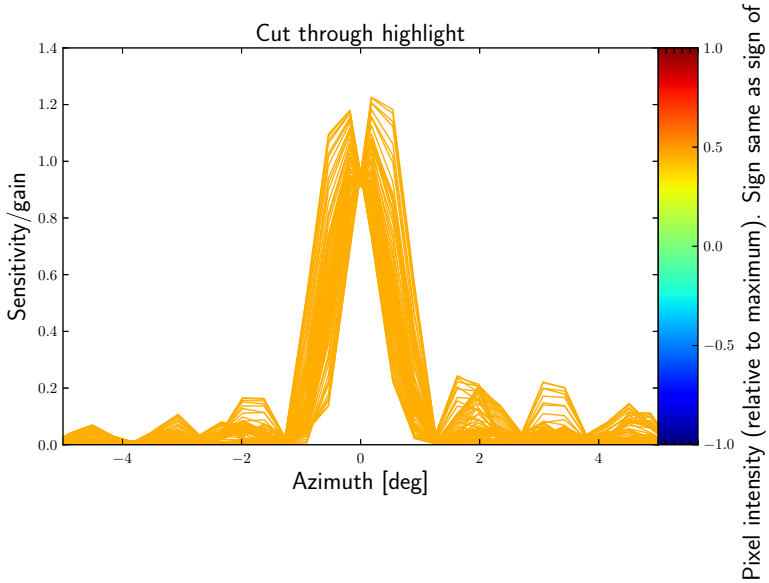


hmm

(d) Windows (ϕ)



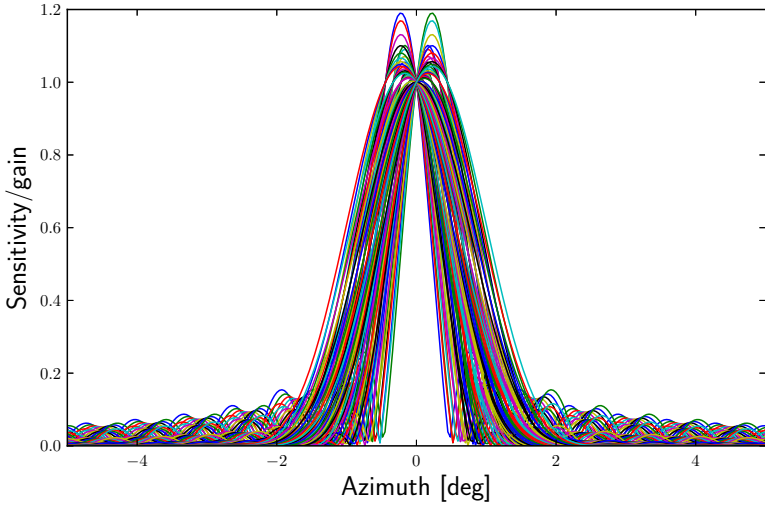
(e) Capon win. resp. through shadow



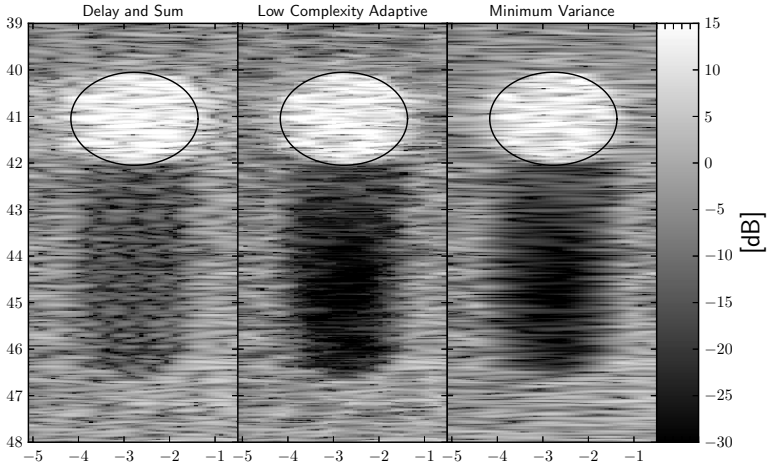
(f) Capon win. resp. through highlight

LCA: Reasonable settings.

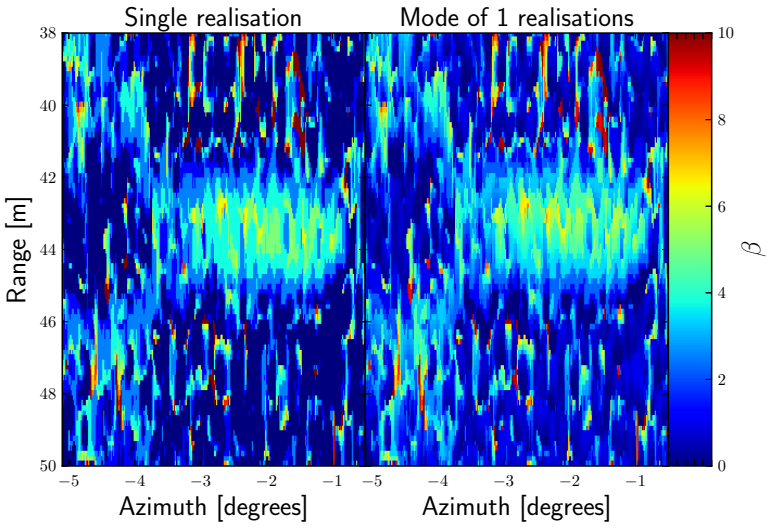
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-0.57, 0.57]$ deg (9 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



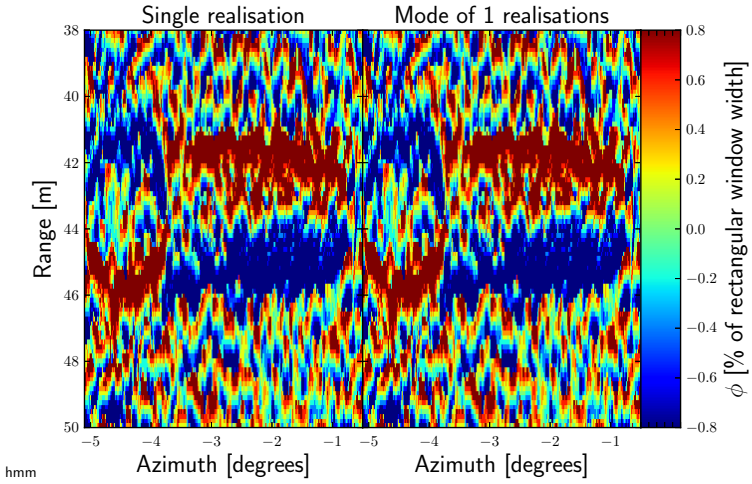
(a) LCA Window Response



(b) Mean images

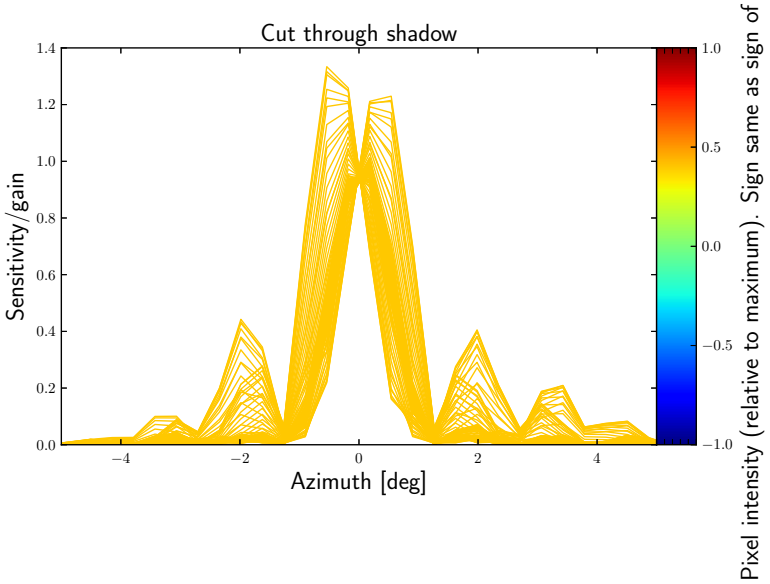


(c) Windows (β)

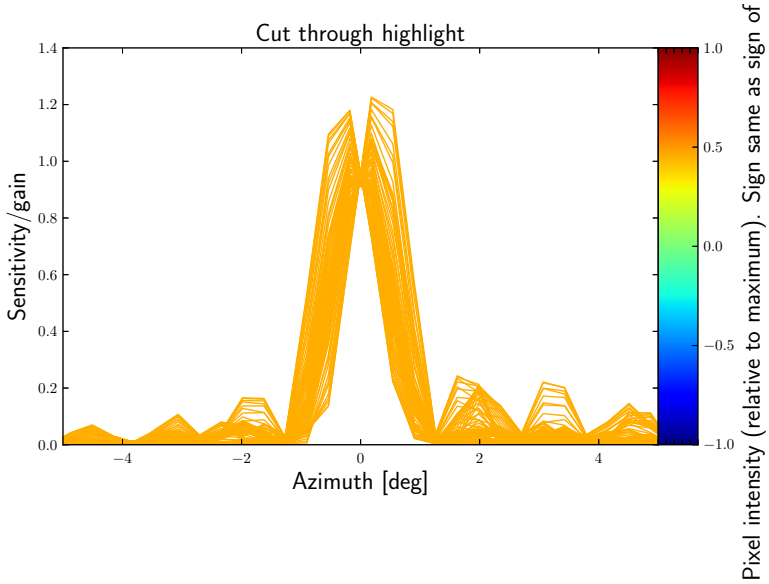


hmm

(d) Windows (ϕ)



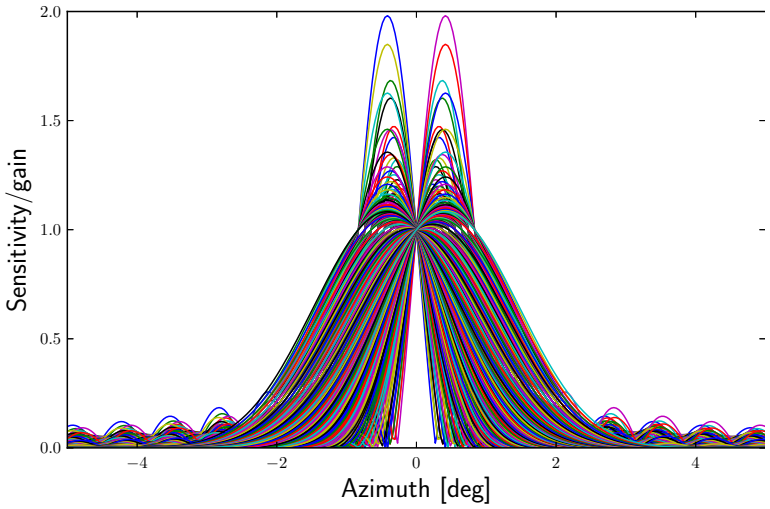
(e) Capon win. resp. through shadow



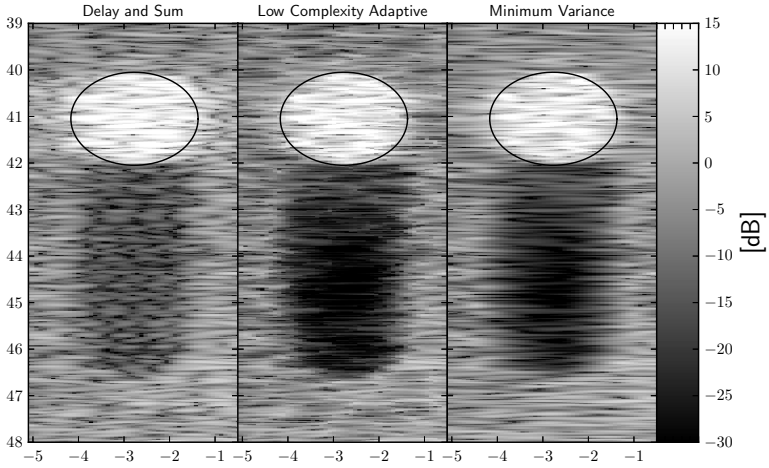
(f) Capon win. resp. through highlight

LCA: Lots of Kaiser windows - wide span.

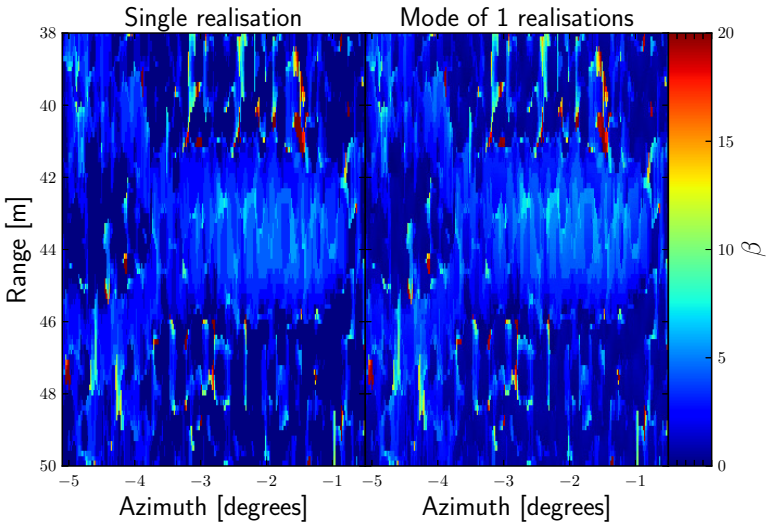
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 20]$ (19 values)	$\phi \in [-1.07, 1.07]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



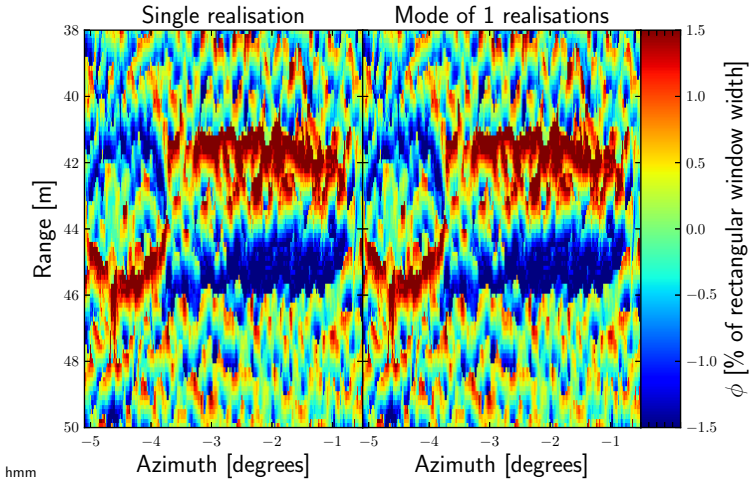
(a) LCA Window Response



(b) Mean images

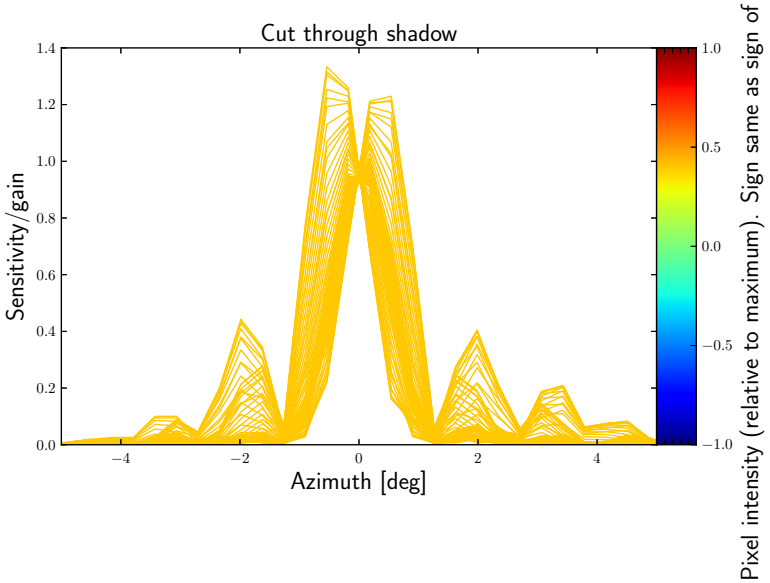


(c) Windows (β)

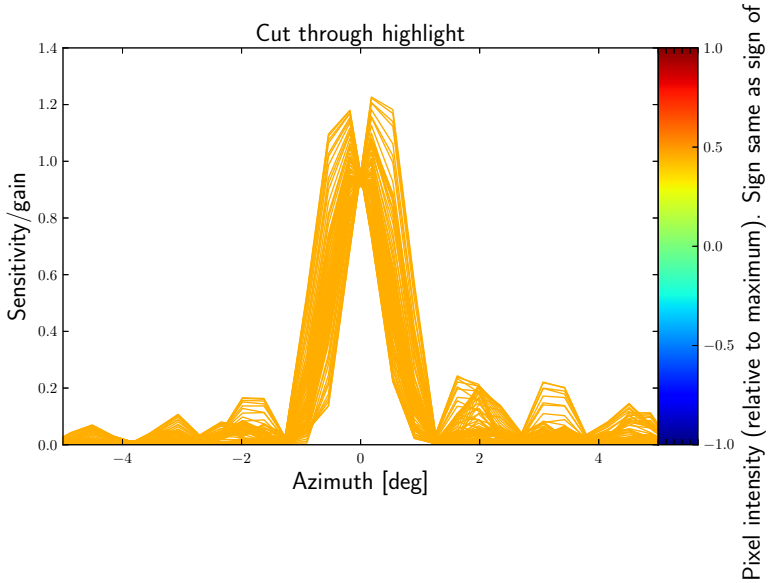


hmm

(d) Windows (ϕ)



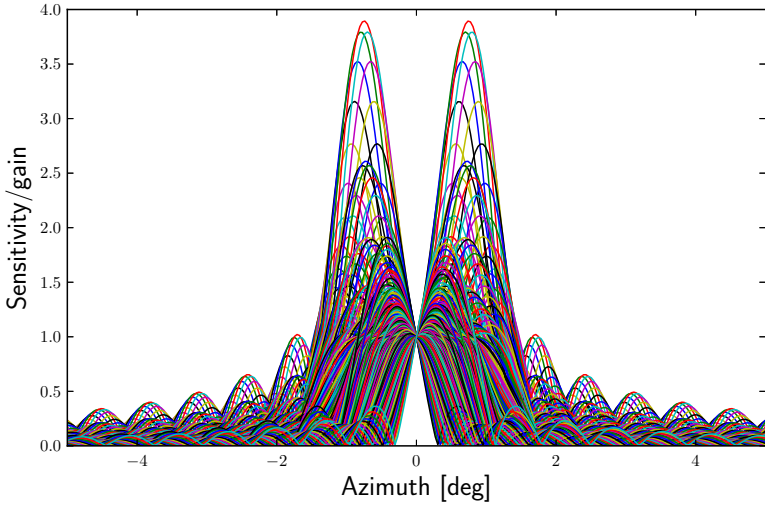
(e) Capon win. resp. through shadow



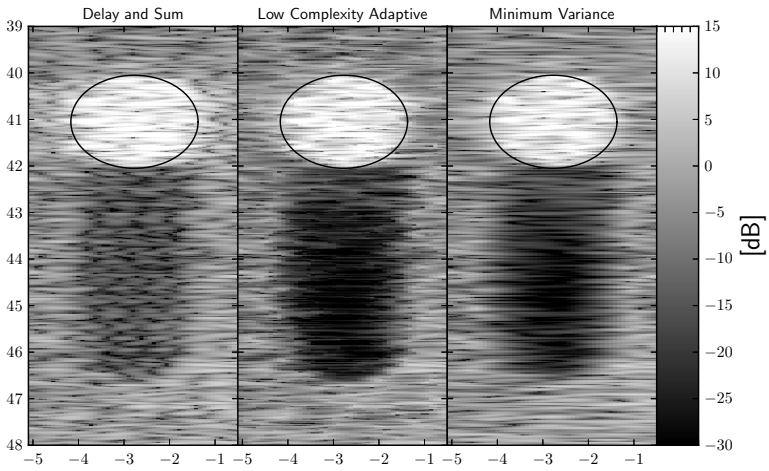
(f) Capon win. resp. through highlight

LCA: Lots of trigonometric windows - wide span.

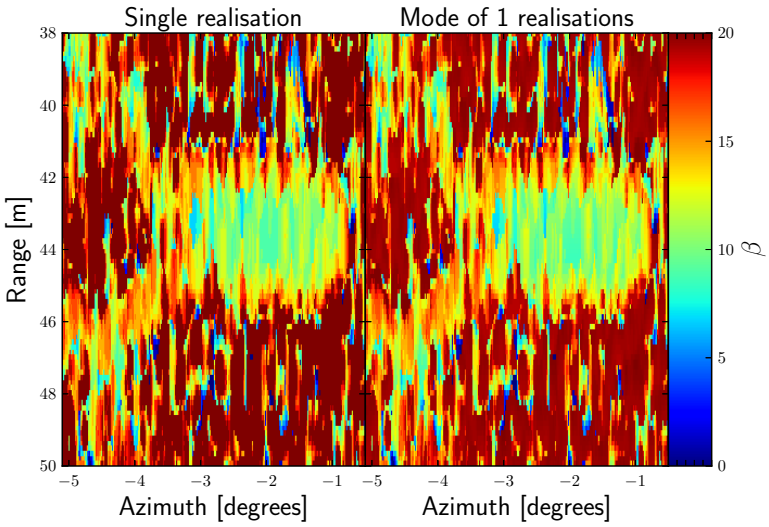
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 20]$ (19 values)	$\phi \in [-1.07, 1.07]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



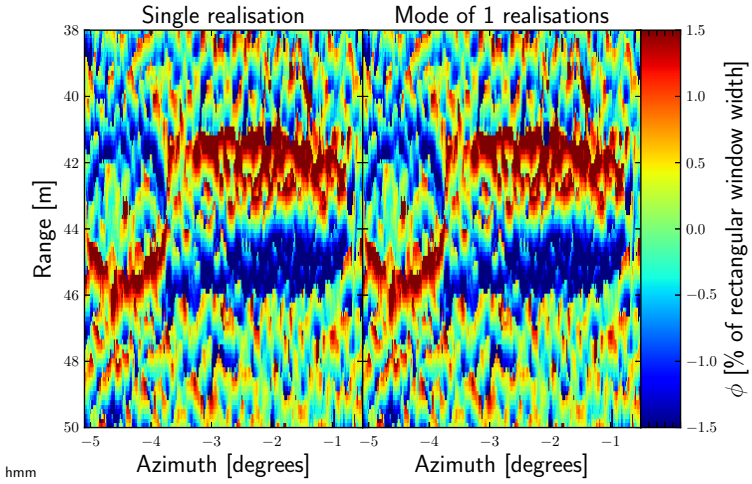
(a) LCA Window Response



(b) Mean images

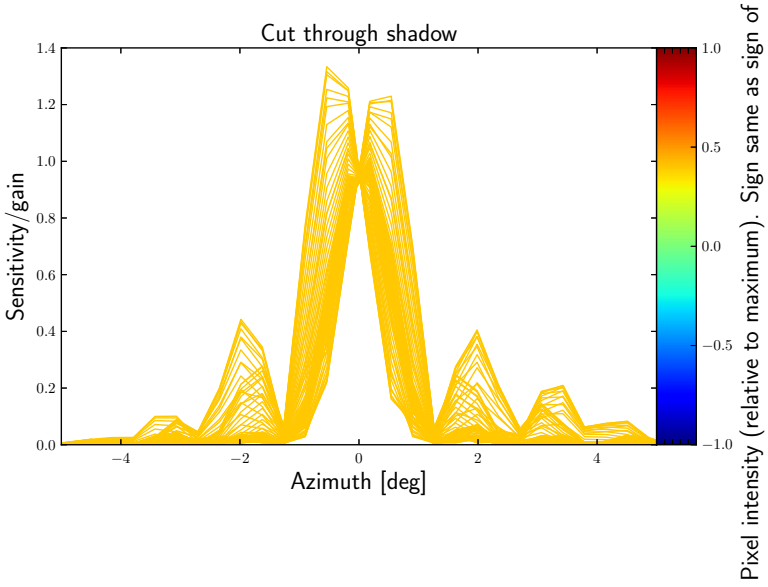


(c) Windows (β)

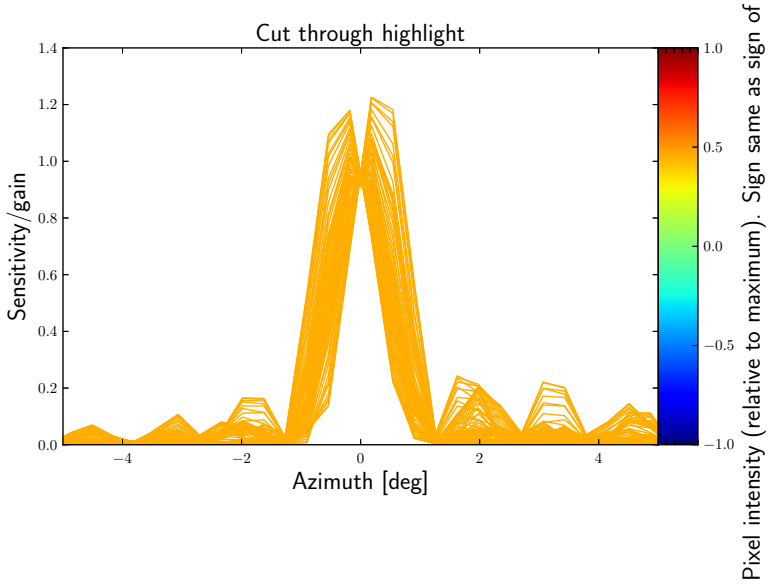


hmm

(d) Windows (ϕ)



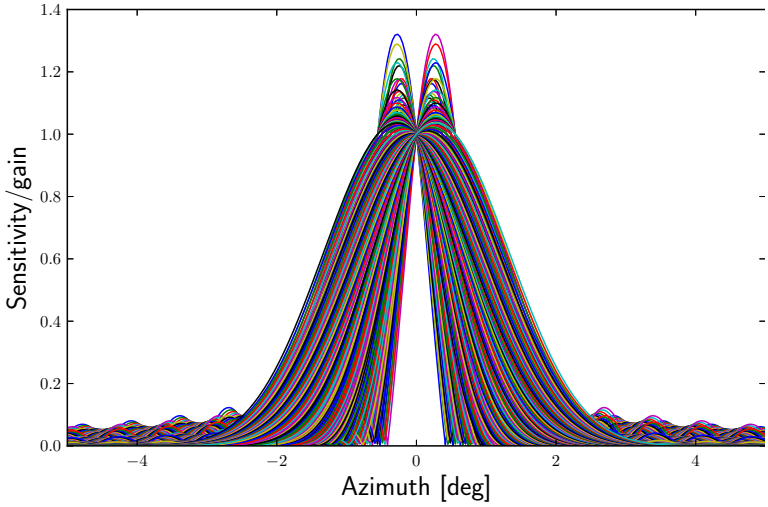
(e) Capon win. resp. through shadow



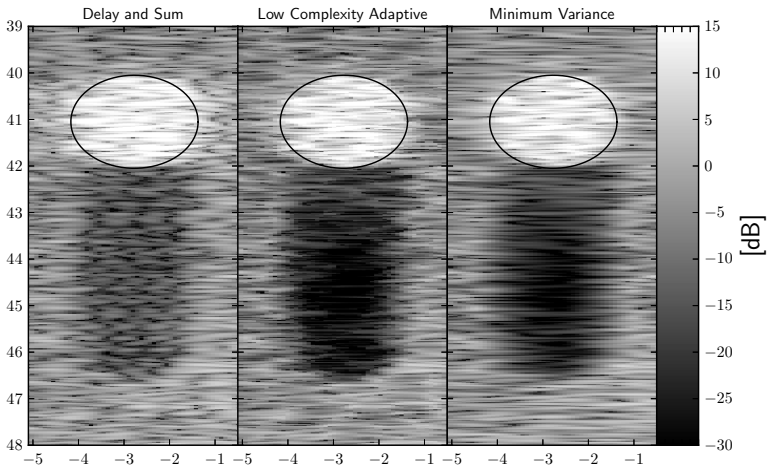
(f) Capon win. resp. through highlight

LCA: Back on Kaiser - reducing steering span.

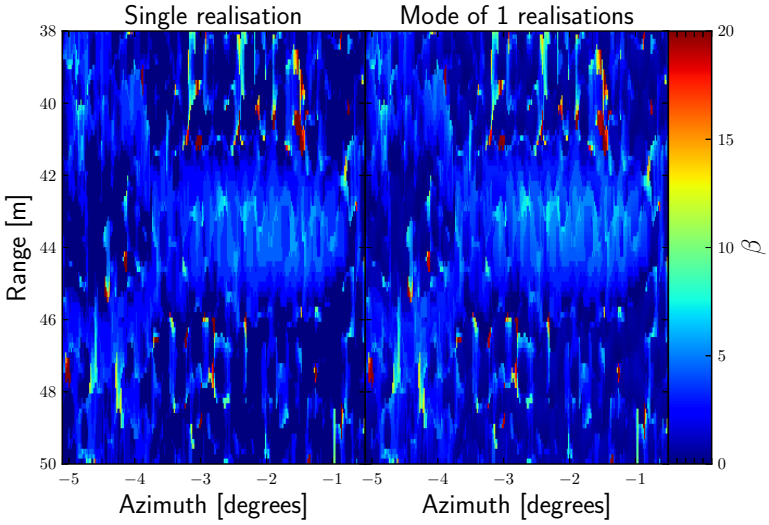
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 20]$ (19 values)	$\phi \in [-0.72, 0.72]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



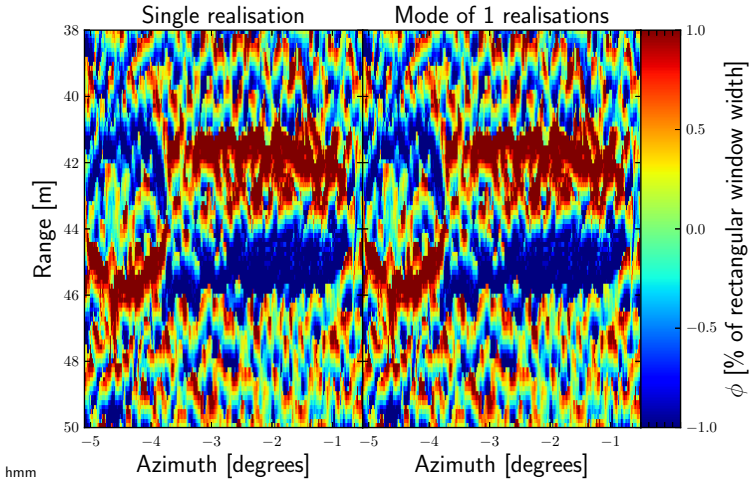
(a) LCA Window Response



(b) Mean images

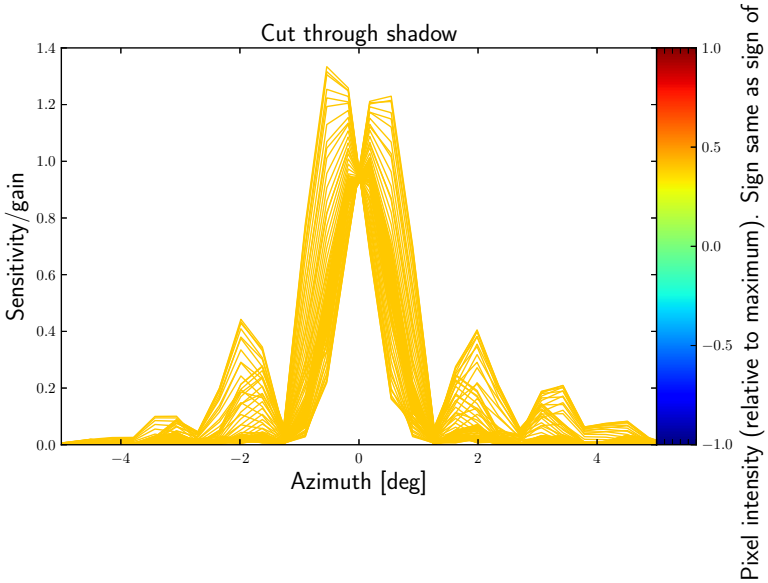


(c) Windows (β)

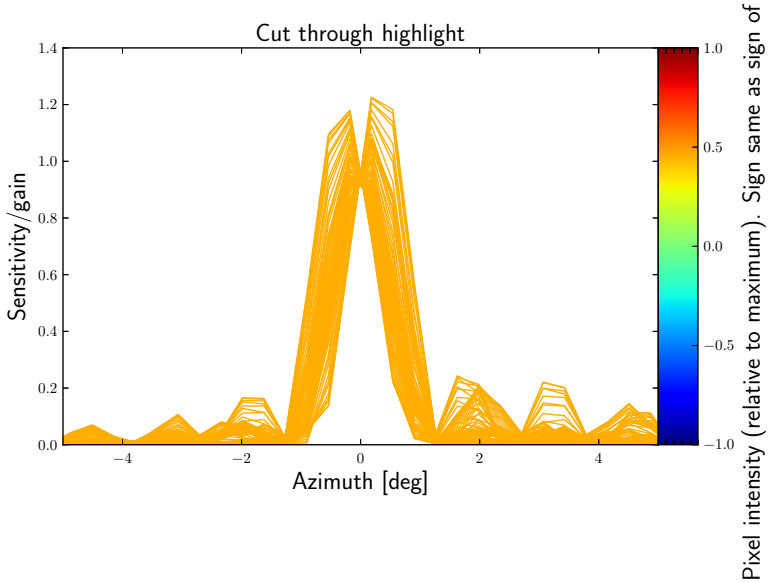


hmm

(d) Windows (ϕ)



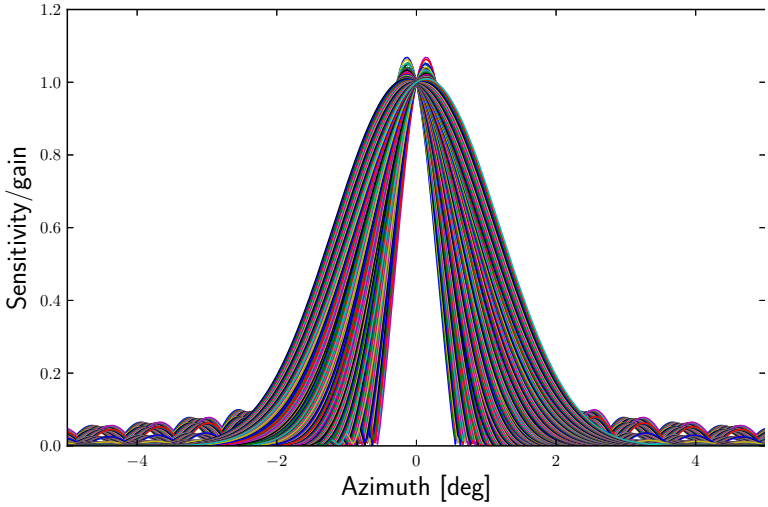
(e) Capon win. resp. through shadow



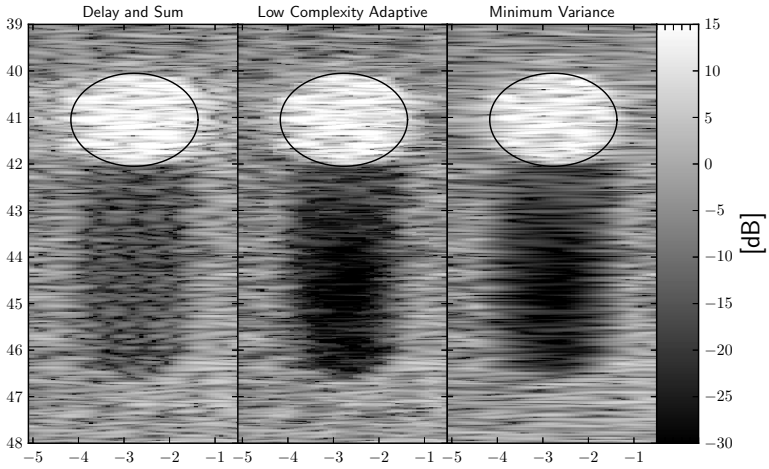
(f) Capon win. resp. through highlight

LCA: Reducing steering span.

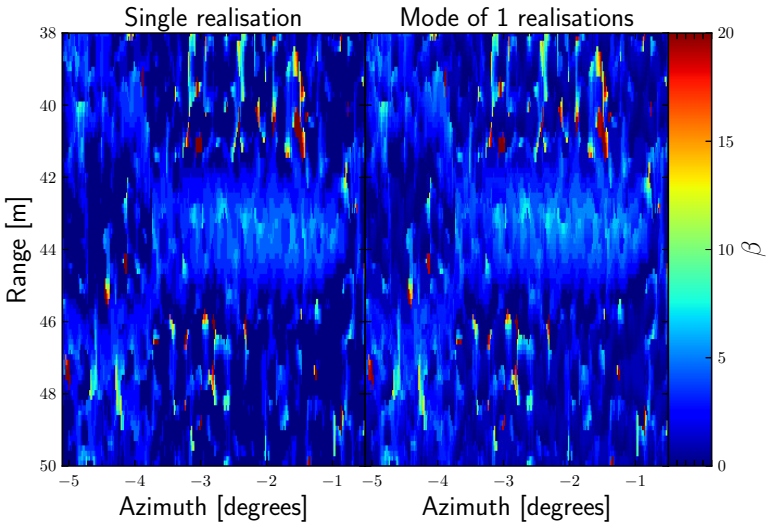
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 20]$ (19 values)	$\phi \in [-0.36, 0.36]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



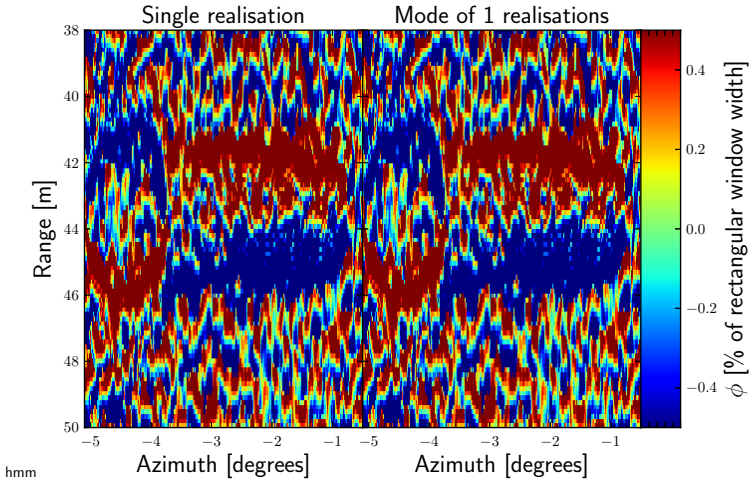
(a) LCA Window Response



(b) Mean images

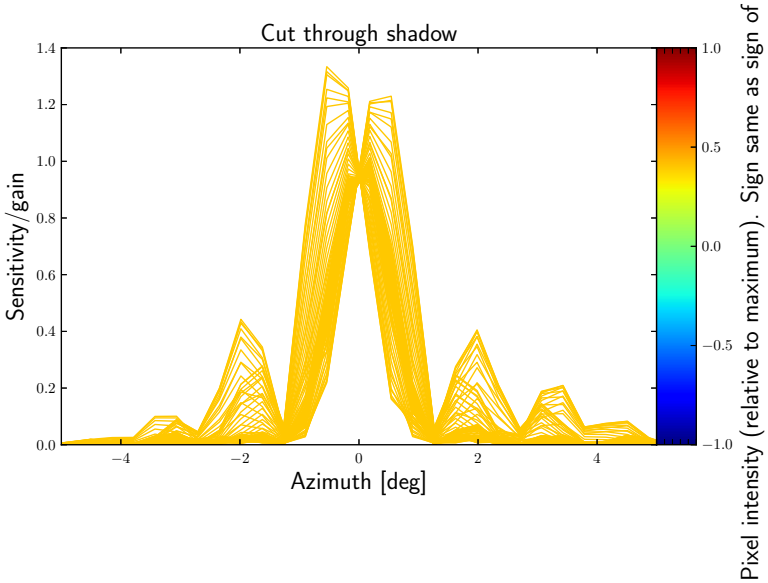


(c) Windows (β)

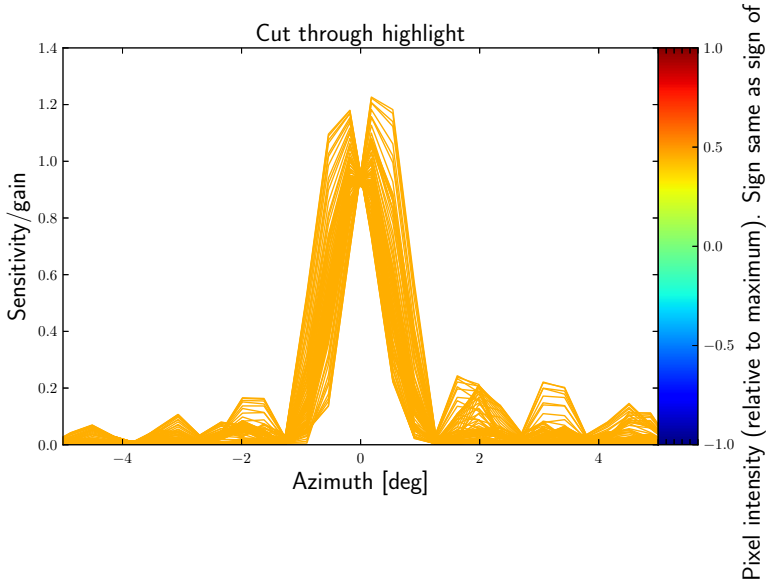


hmm

(d) Windows (ϕ)



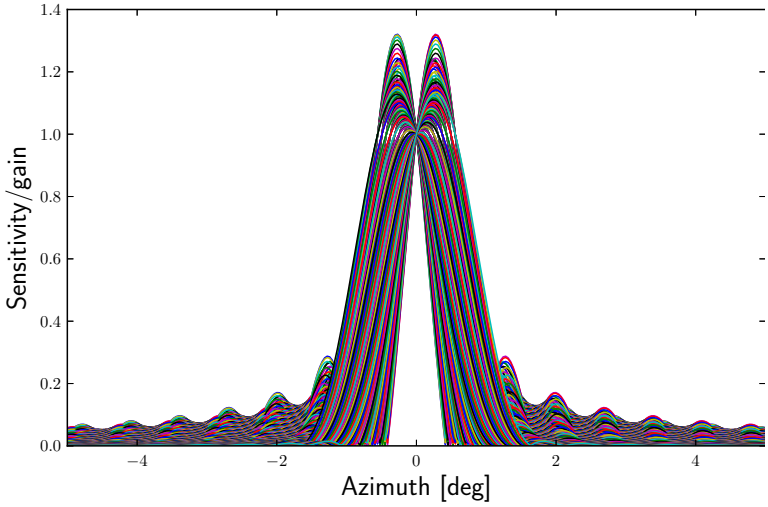
(e) Capon win. resp. through shadow



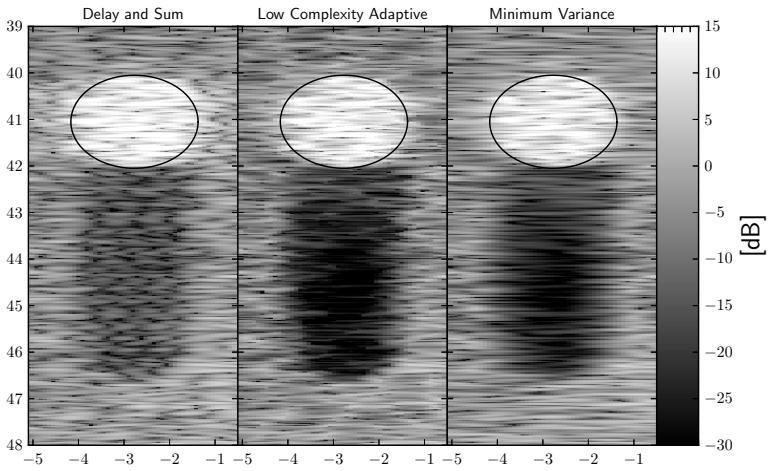
(f) Capon win. resp. through highlight

LCA: Adjusting resolution/SNR.

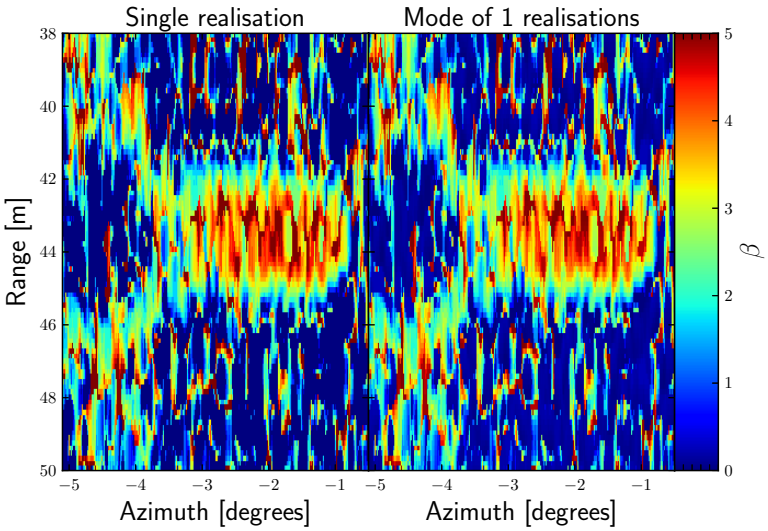
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 5]$ (19 values)	$\phi \in [-0.72, 0.72]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



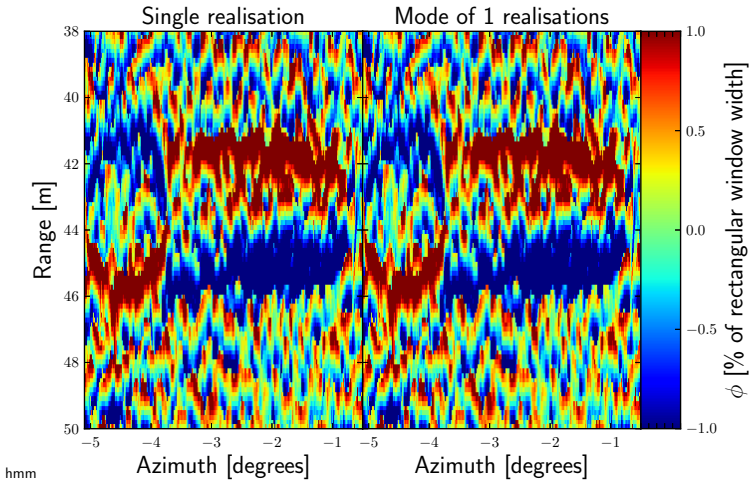
(a) LCA Window Response



(b) Mean images

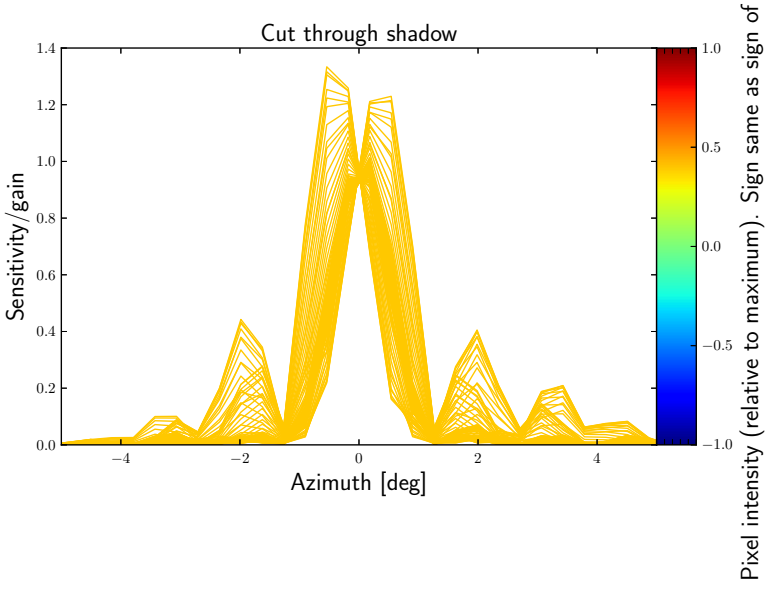


(c) Windows (β)

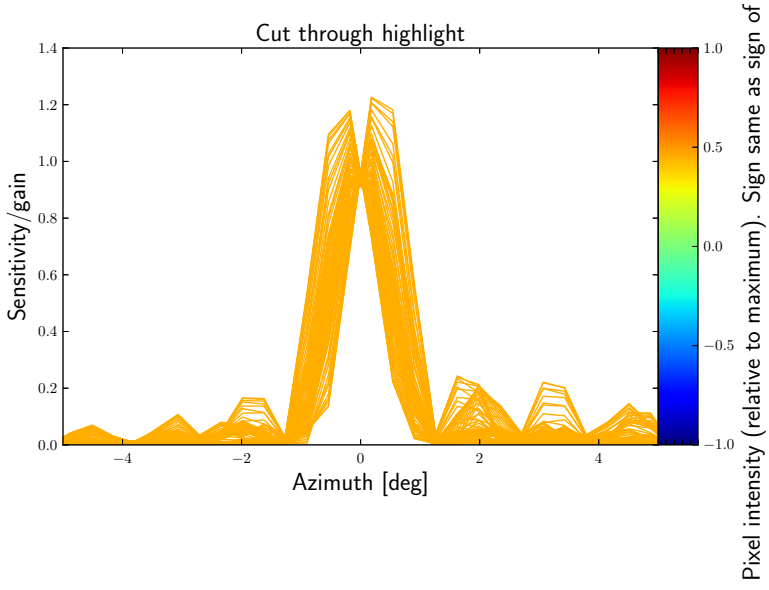


hmm

(d) Windows (ϕ)



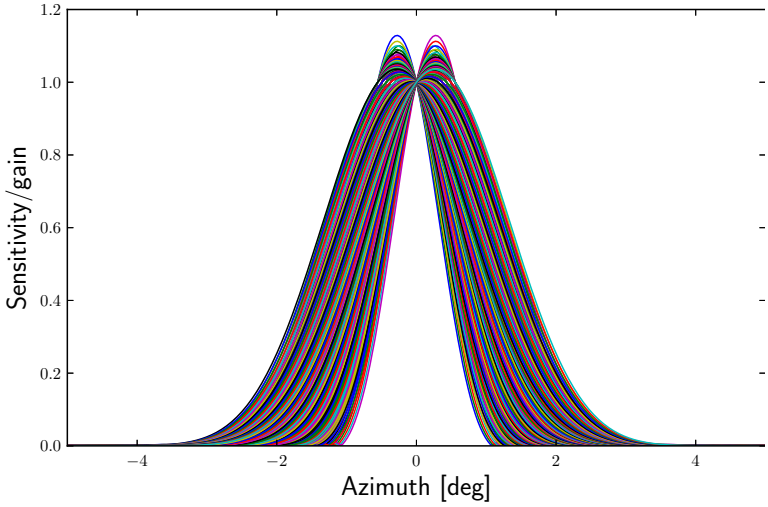
(e) Capon win. resp. through shadow



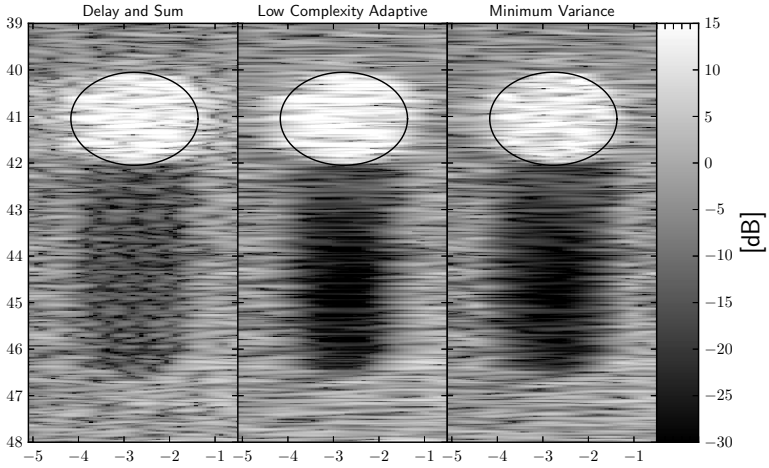
(f) Capon win. resp. through highlight

LCA: Adjusting resolution/SNR.

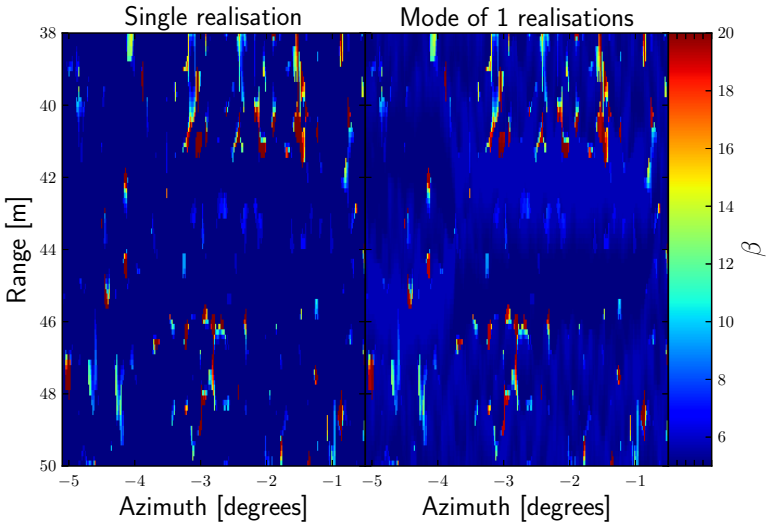
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [5, 20]$ (19 values)	$\phi \in [-0.72, 0.72]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



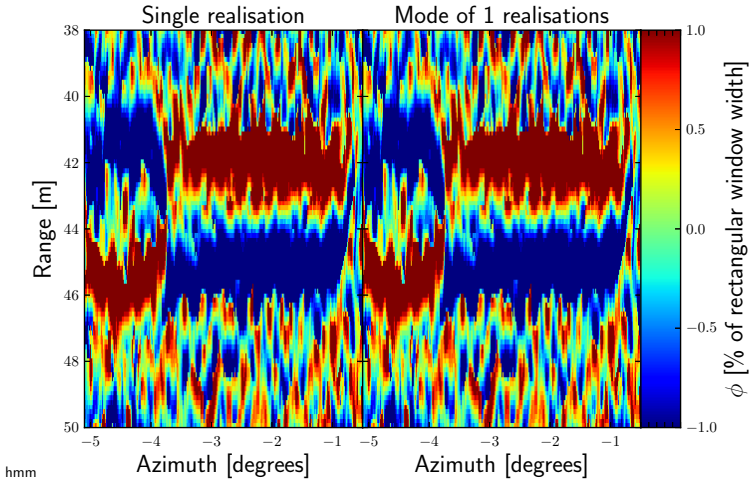
(a) LCA Window Response



(b) Mean images

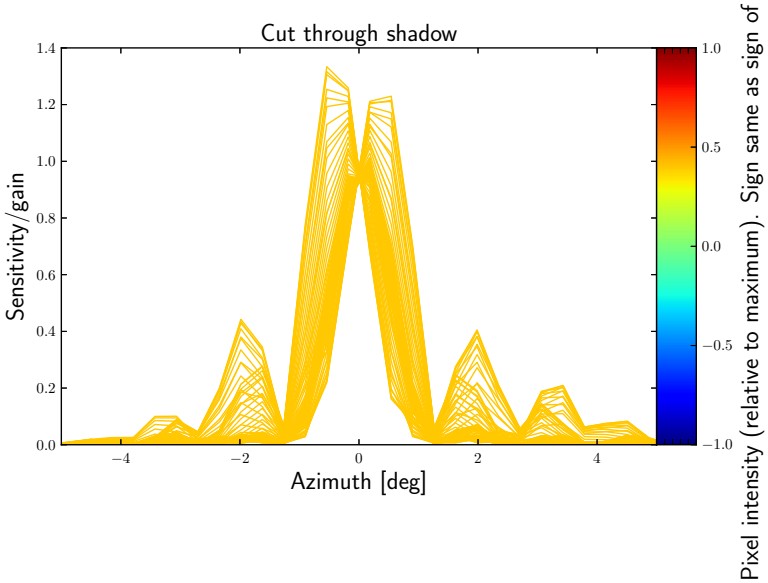


(c) Windows (β)

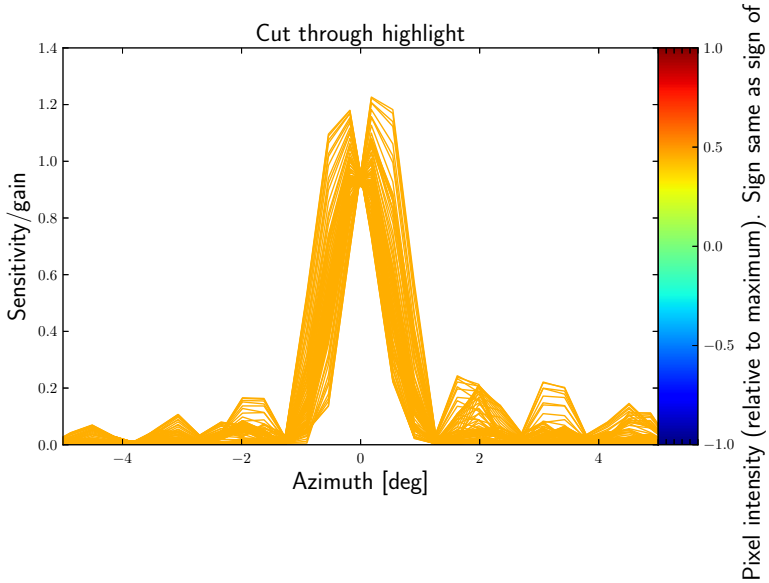


hmm

(d) Windows (ϕ)



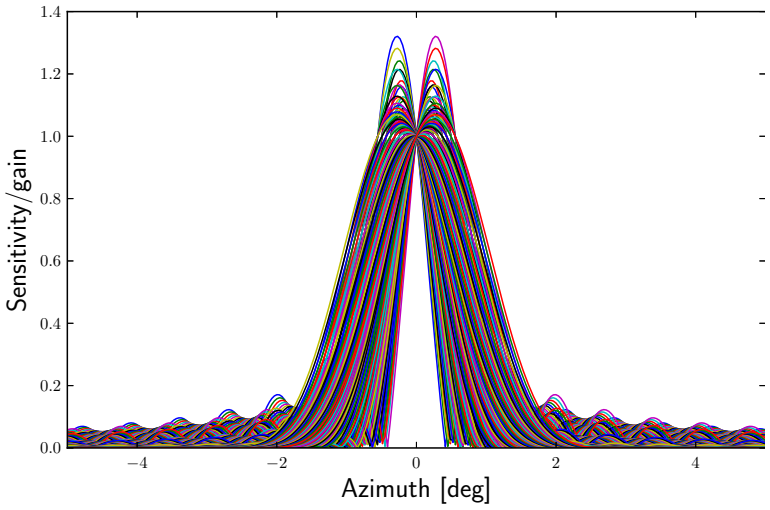
(e) Capon win. resp. through shadow



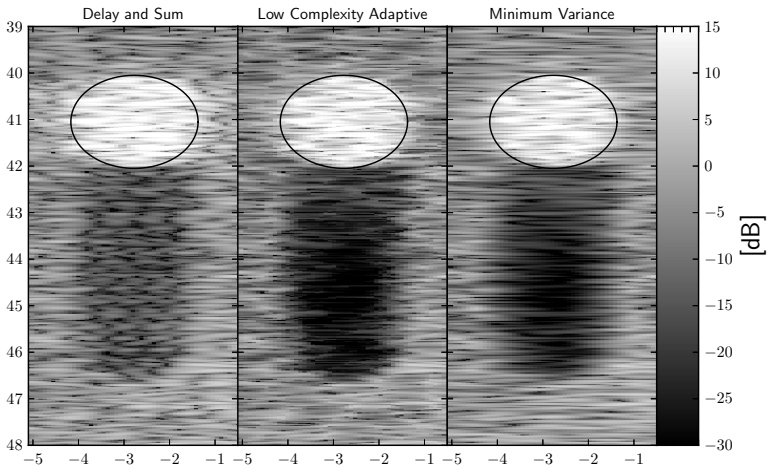
(f) Capon win. resp. through highlight

LCA: Fewer windows.

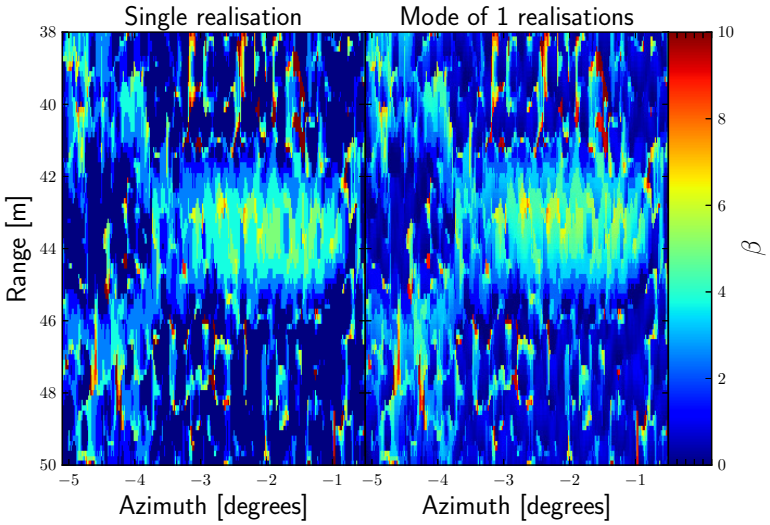
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-0.72, 0.72]$ deg (19 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



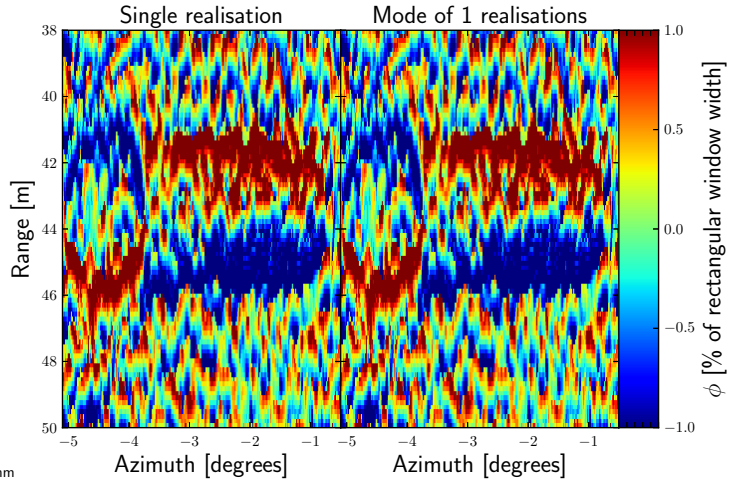
(a) LCA Window Response



(b) Mean images

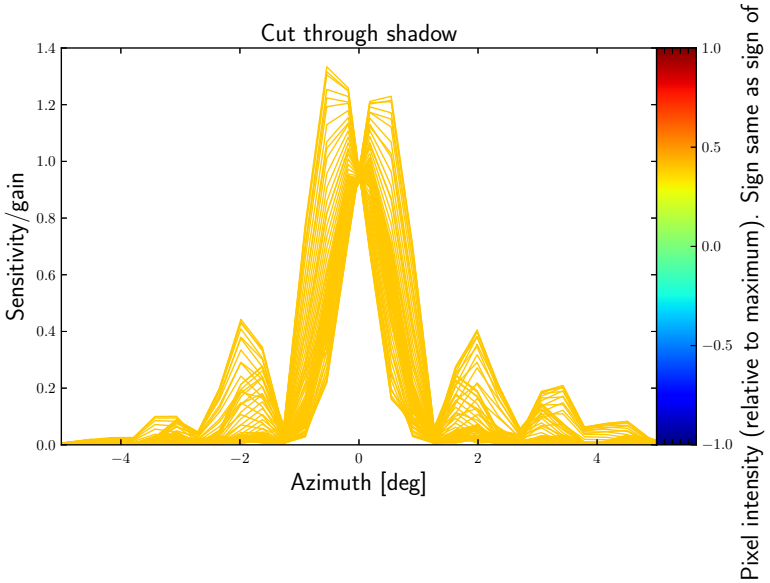


(c) Windows (β)

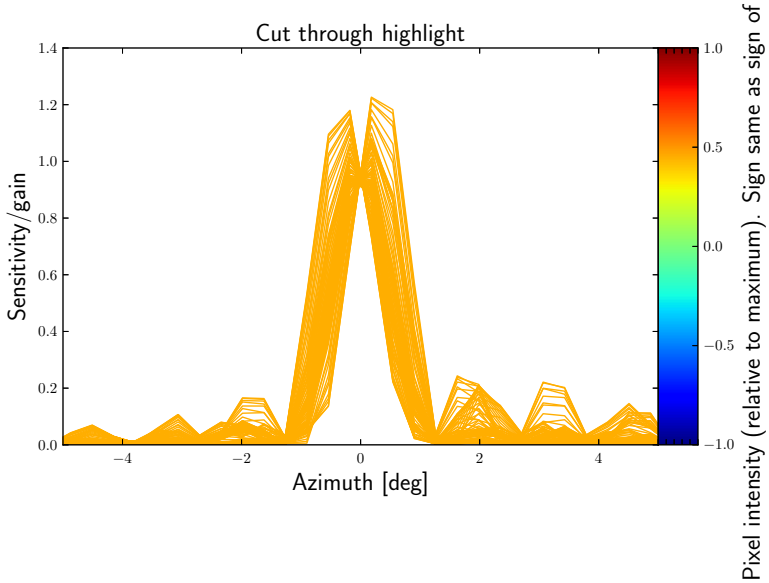


hmm

(d) Windows (ϕ)



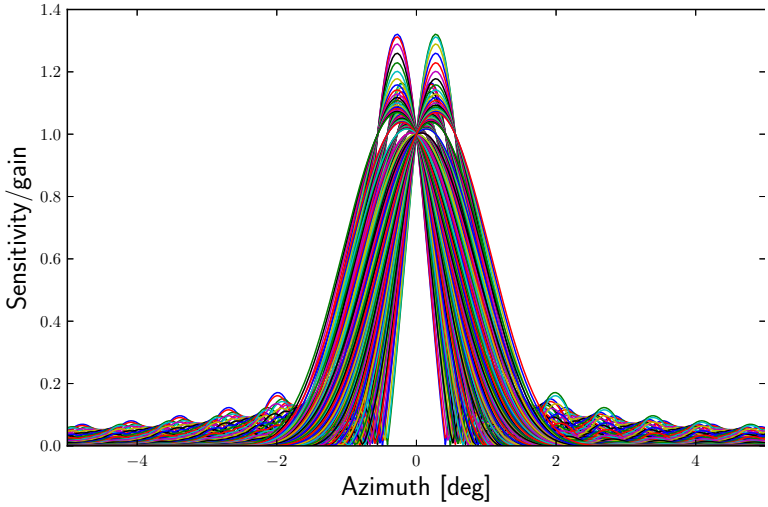
(e) Capon win. resp. through shadow



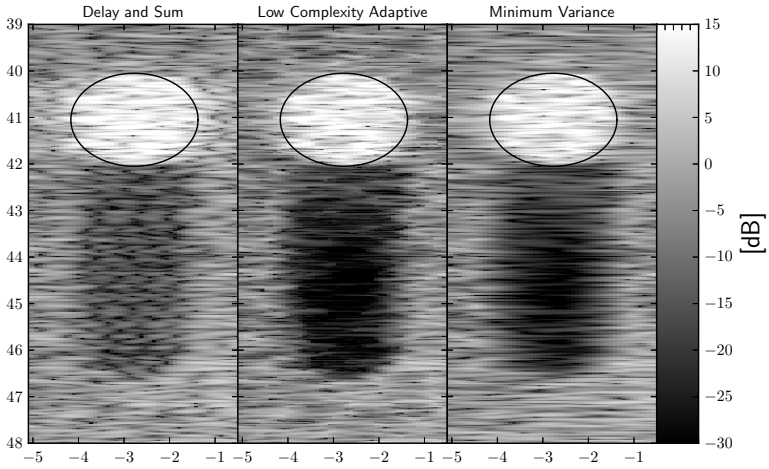
(f) Capon win. resp. through highlight

LCA: Fewer steering angles.

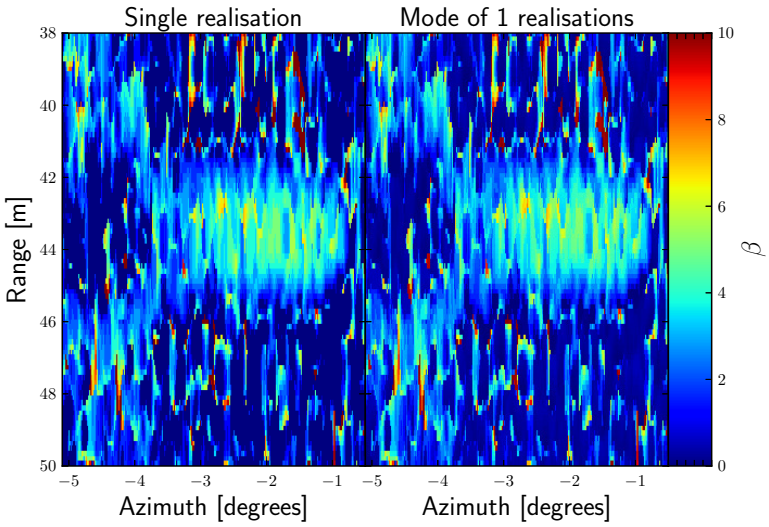
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (19 values)	$\phi \in [-0.72, 0.72]$ deg (9 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



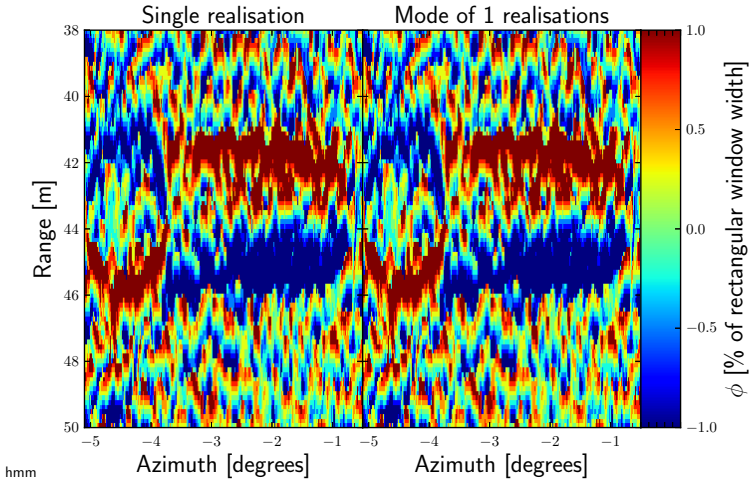
(a) LCA Window Response



(b) Mean images

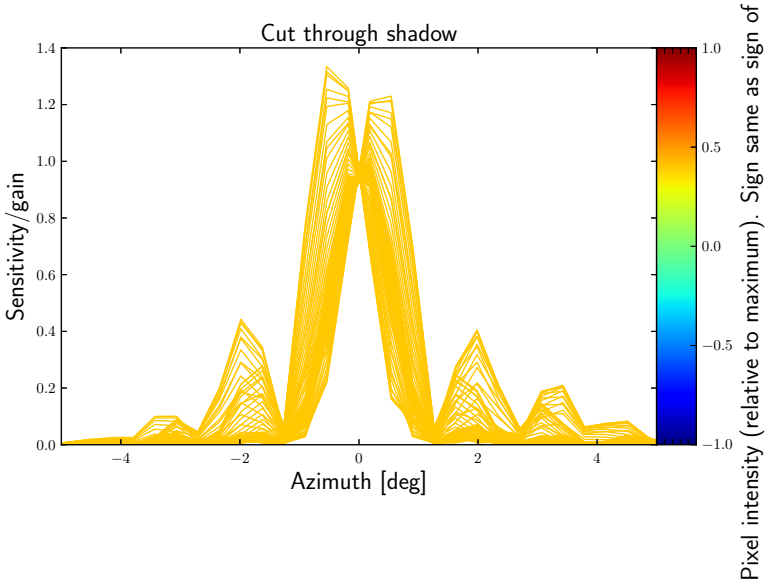


(c) Windows (β)

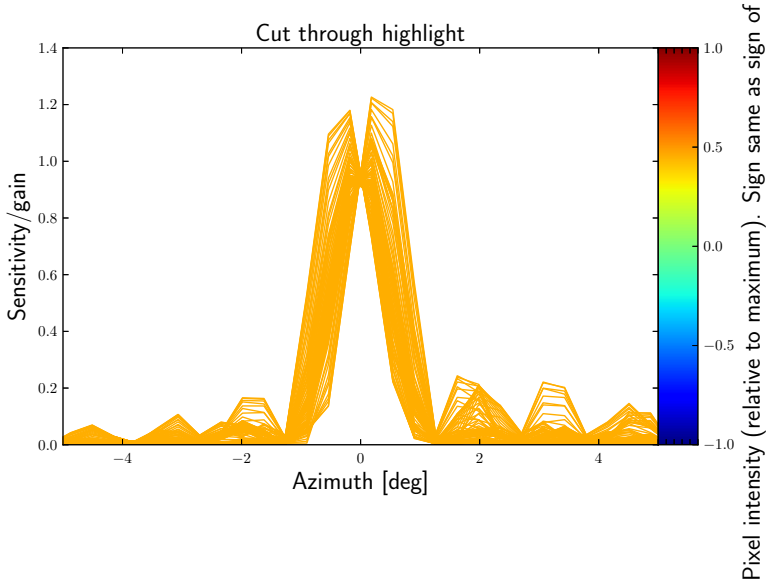


hmm

(d) Windows (ϕ)



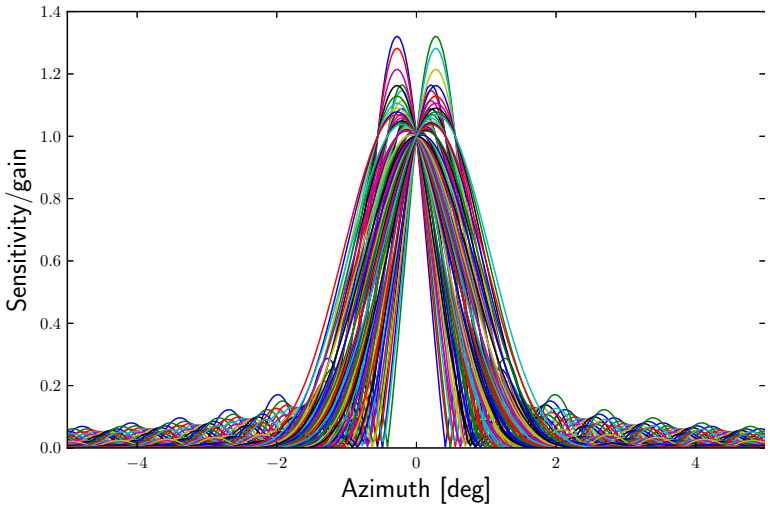
(e) Capon win. resp. through shadow



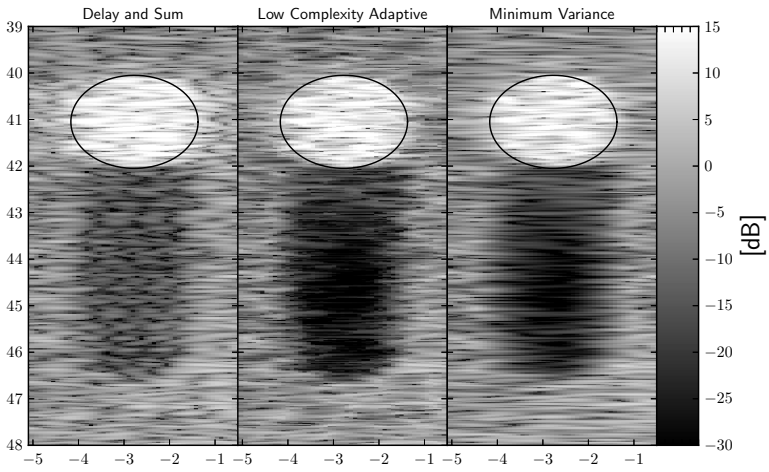
(f) Capon win. resp. through highlight

LCA: Fewer both.

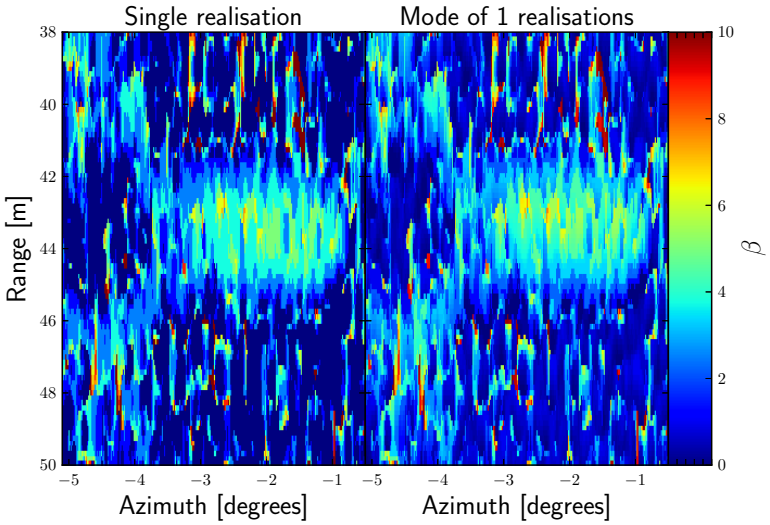
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 10]$ (9 values)	$\phi \in [-0.72, 0.72]$ deg (9 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



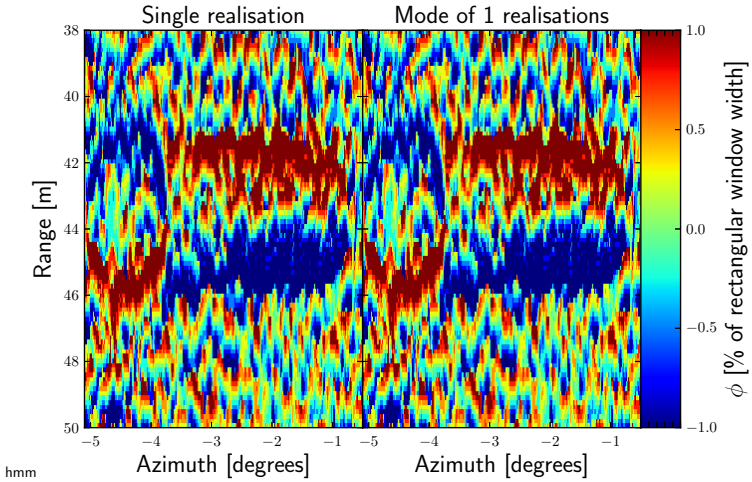
(a) LCA Window Response



(b) Mean images

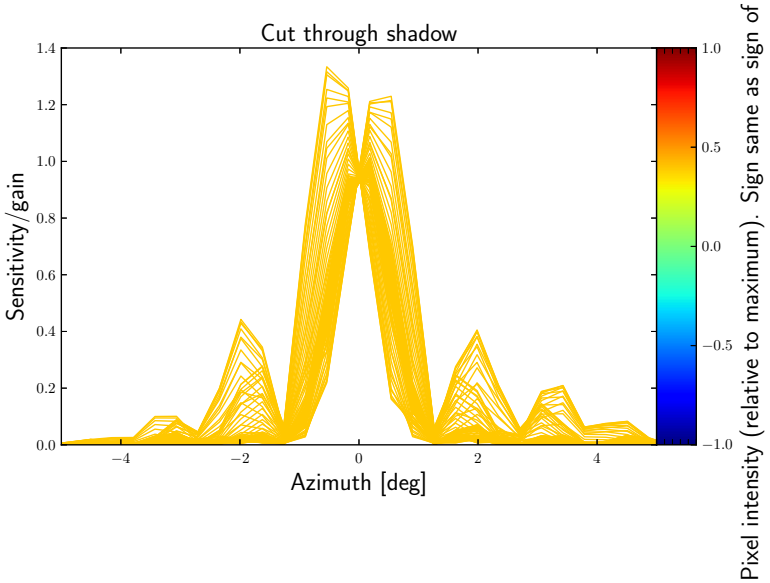


(c) Windows (β)

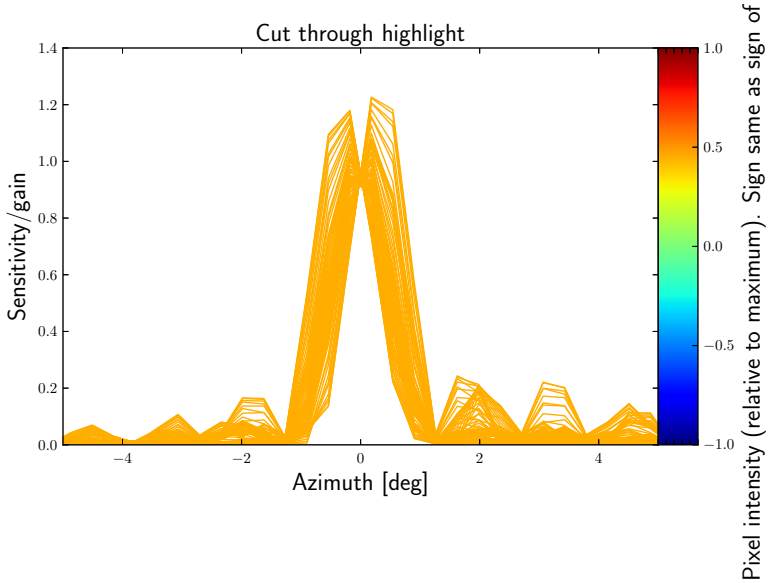


hmm

(d) Windows (ϕ)



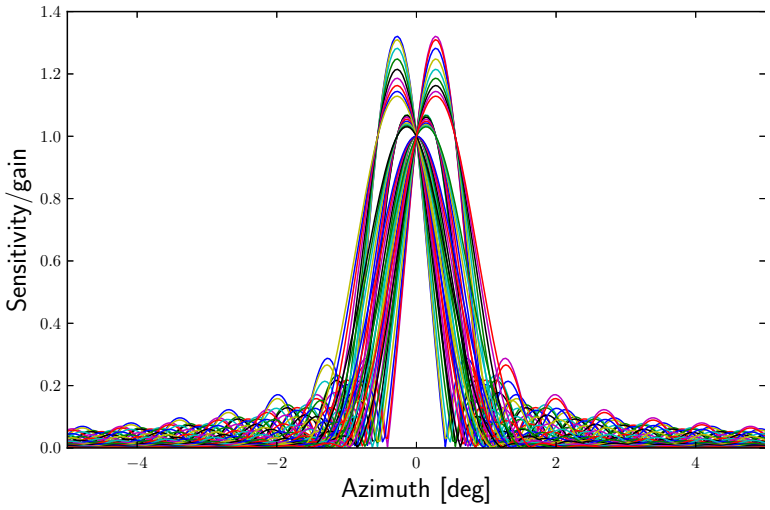
(e) Capon win. resp. through shadow



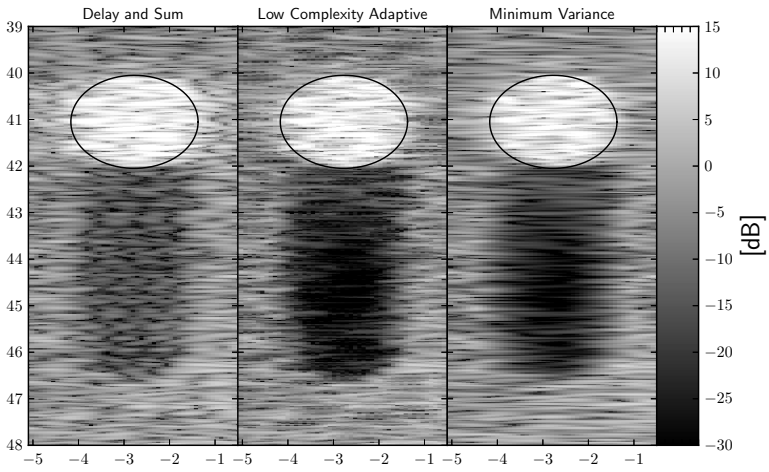
(f) Capon win. resp. through highlight

LCA: Even less.

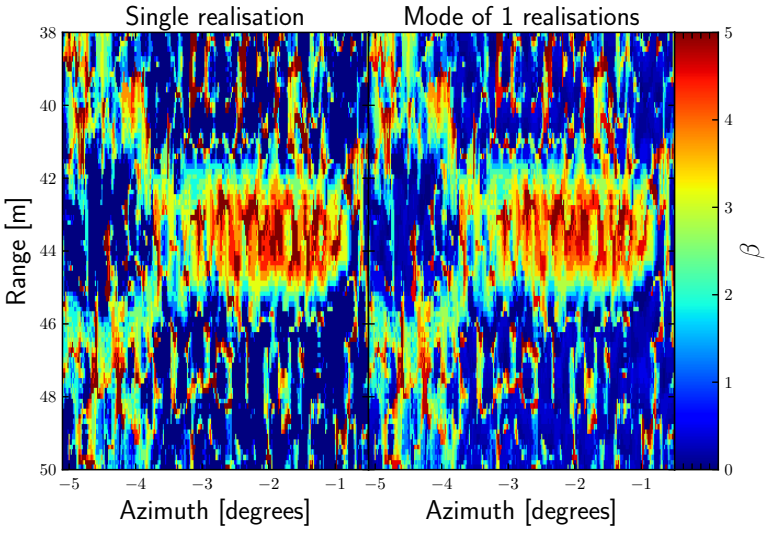
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 5]$ (9 values)	$\phi \in [-0.72, 0.72]$ deg (5 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



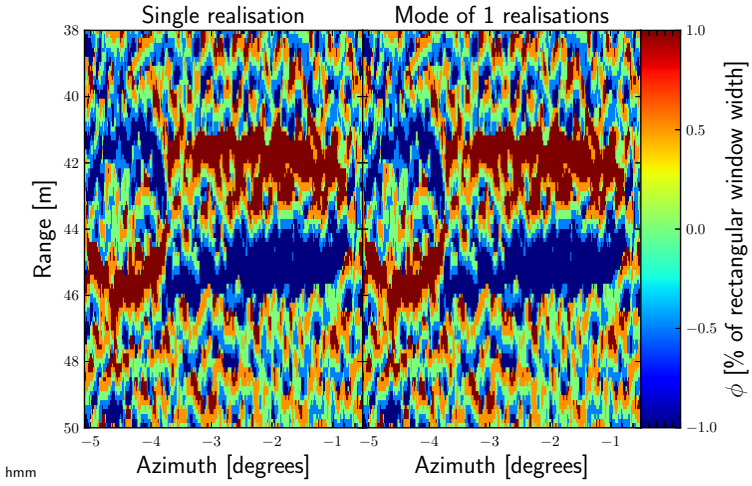
(a) LCA Window Response



(b) Mean images

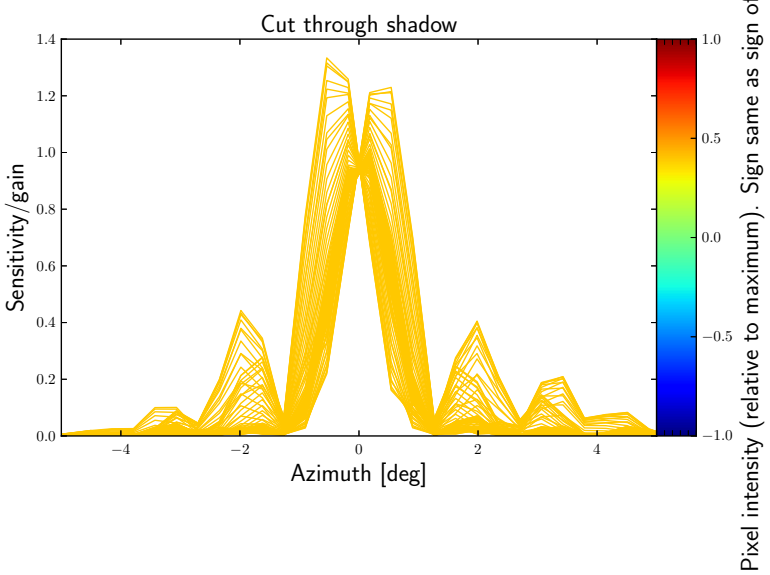


(c) Windows (β)

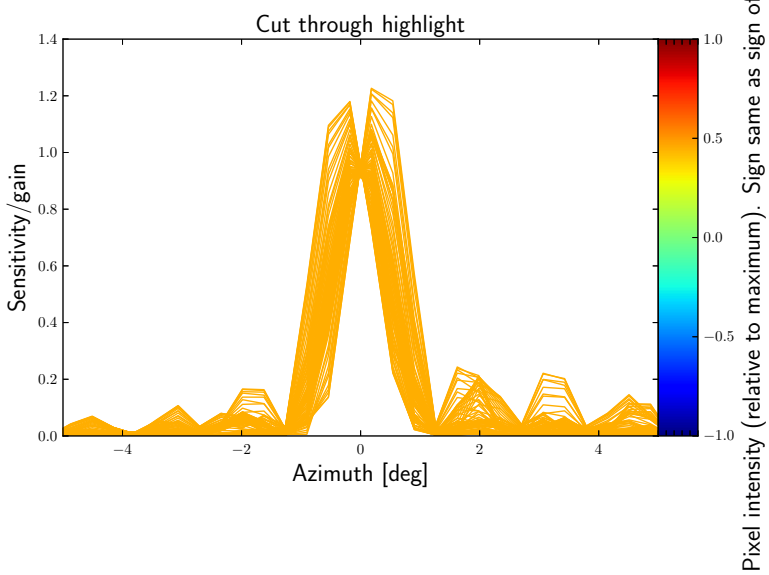


hmm

(d) Windows (ϕ)



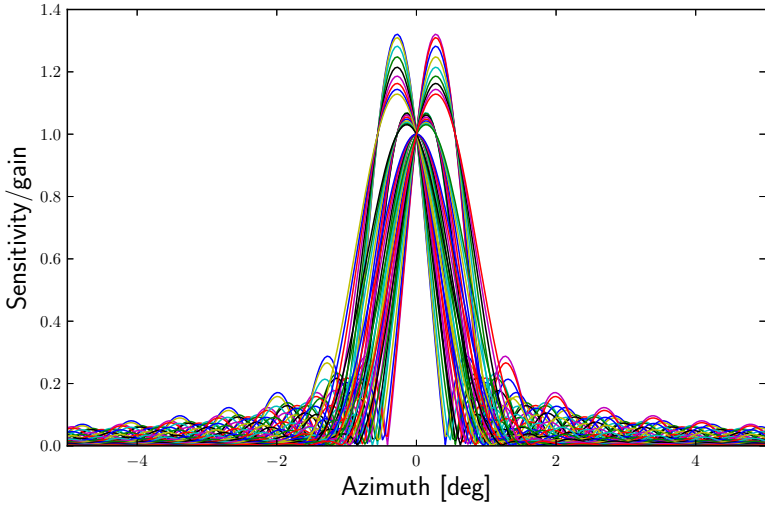
(e) Capon win. resp. through shadow



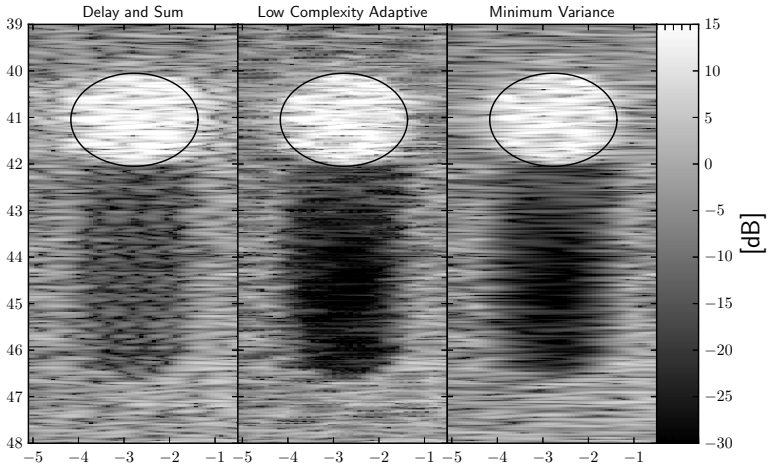
(f) Capon win. resp. through highlight

LCA: Hardly any.

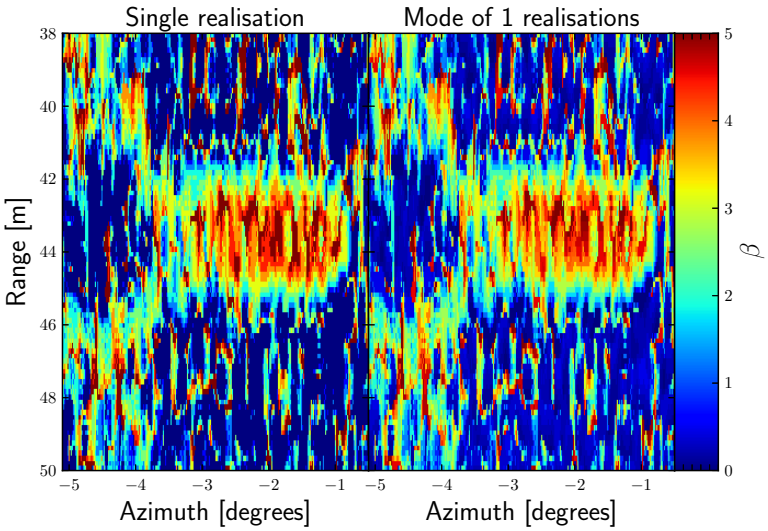
General	M = 32	$\Delta r = \frac{c}{2B}$ = 2.5 cm	$\frac{640\,\text{pixels}]/12\,\text{m}}{\Delta r} = \frac{4}{3}$
LCA	$\beta \in [0, 5]$ (9 values)	$\phi \in [-0.72, 0.72]$ deg (5 values)	Navg = 7
Capon	Δ = 0.01	L = 16	Navg = 7



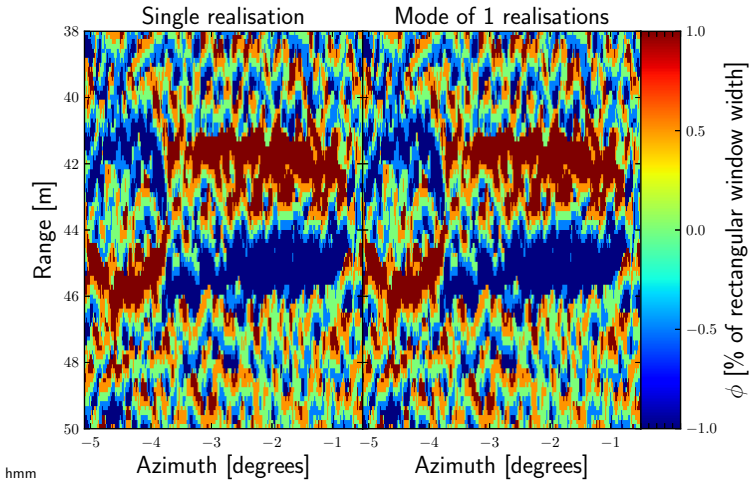
(a) LCA Window Response



(b) Mean images

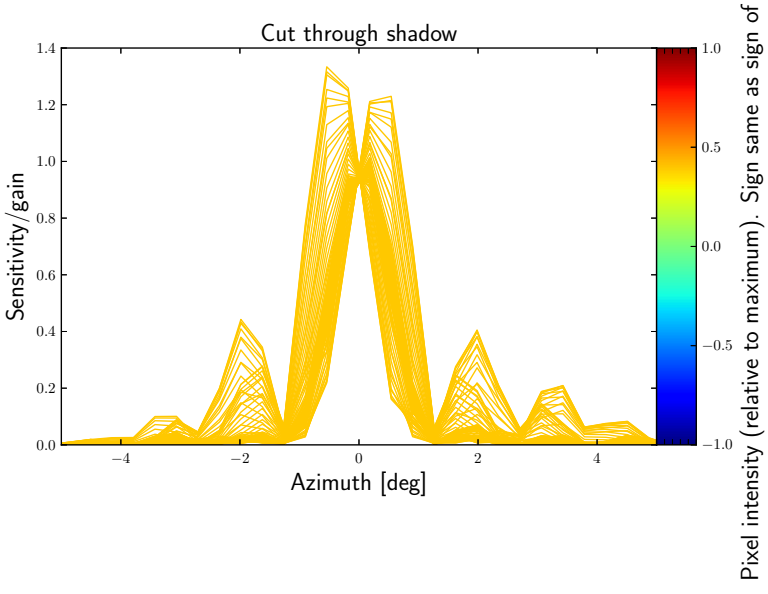


(c) Windows (β)

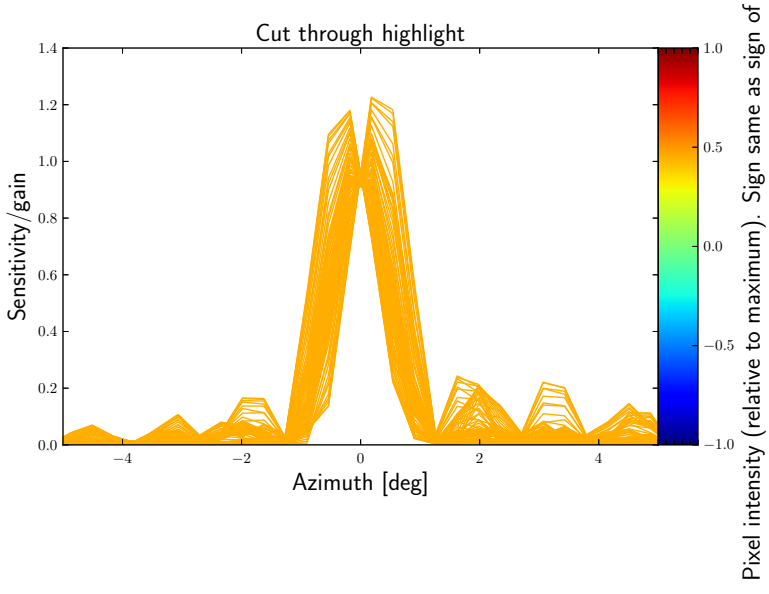


hmm

(d) Windows (ϕ)



(e) Capon win. resp. through shadow



(f) Capon win. resp. through highlight