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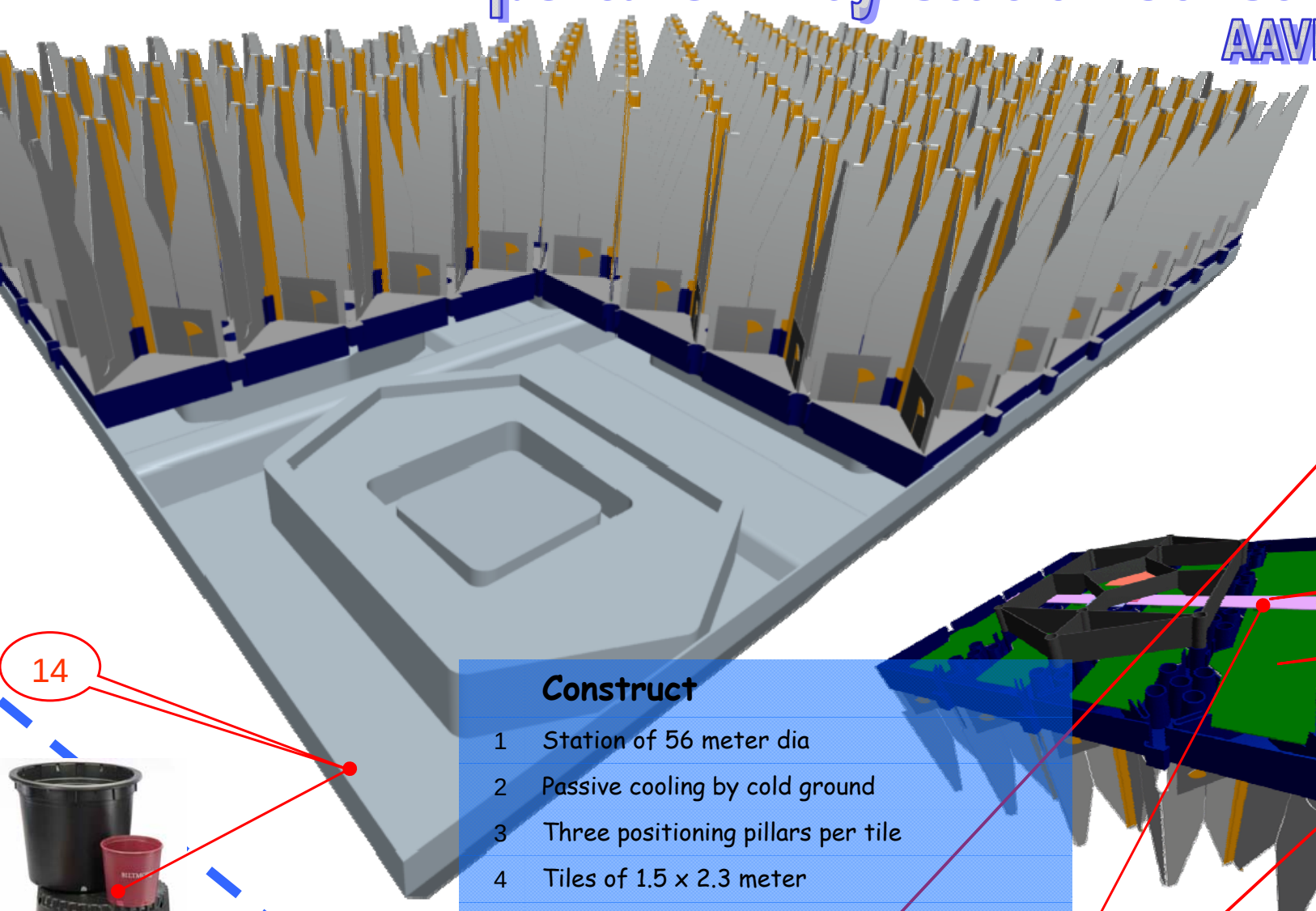
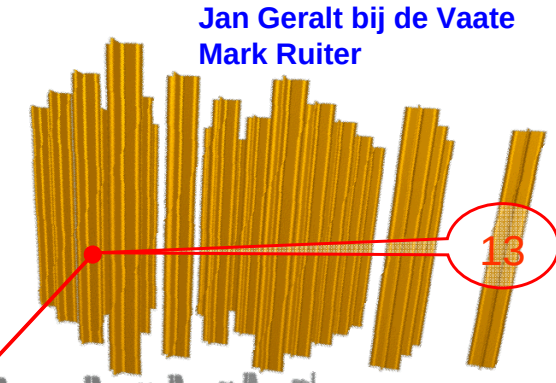
Netherlands Institute for Radio Astronomy

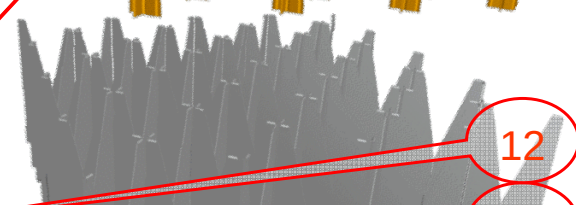
Aperture Array station construction concepts

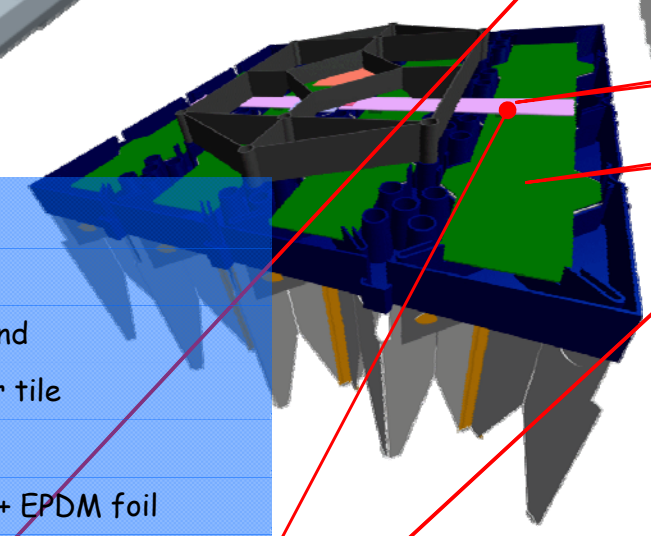
AAVP Aluminum Antennae

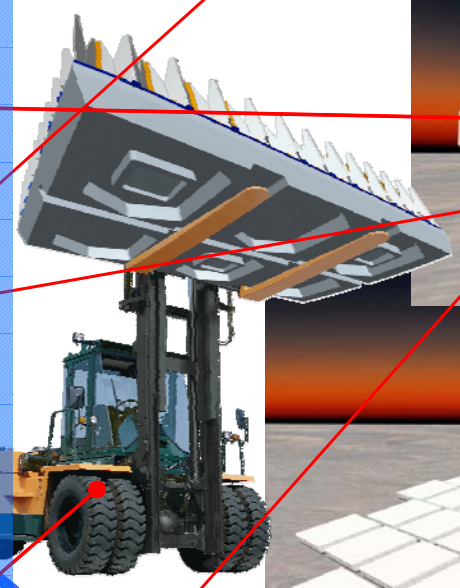
Johan Pragt
Raymond van den Brink
Jan Geralt bij de Vaate
Mark Ruiter

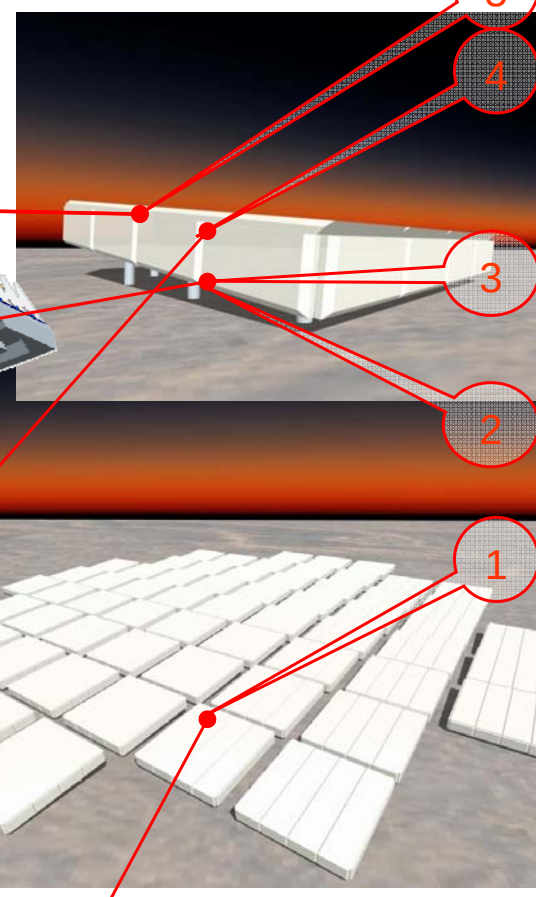




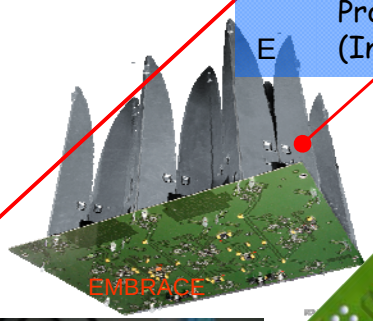


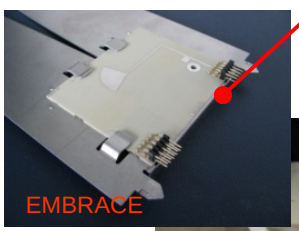


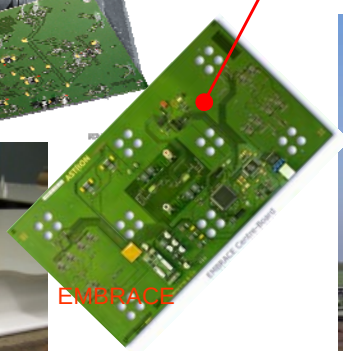


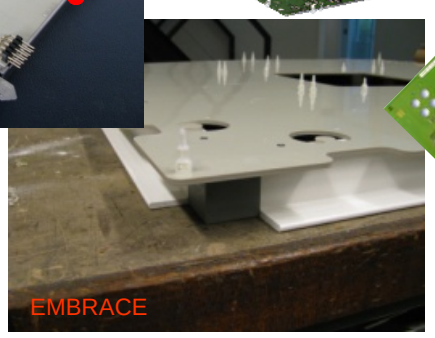


	Construct
1	Station of 56 meter dia
2	Passive cooling by cold ground
3	Three positioning pillars per tile
4	Tiles of 1.5 x 2.3 meter
5	Cover 1.5 x 2.3 m, PS Foam + EPDM foil
6	6 subtiles per tile of 0.75x0.75 meter
7	Metal groundplane, sputtering or metal foil
8	Plastic structure, injection moulded
9	Feedboard with LNA
10	Aluminum antennae, reduced height
11	Connection boards, small
12	Central processing board
13	Aluminum profile antennae interconnect
14	Bottom, plastic vacuum moulded
	Define, Develop, Investigate
A	Station with 3 degree angle performance
B	Height position in steps over the station
C	Tiles electrical coupled yes/no
D	Thermal control to simulate and develop
E	Production automation, assembly process (Industry)









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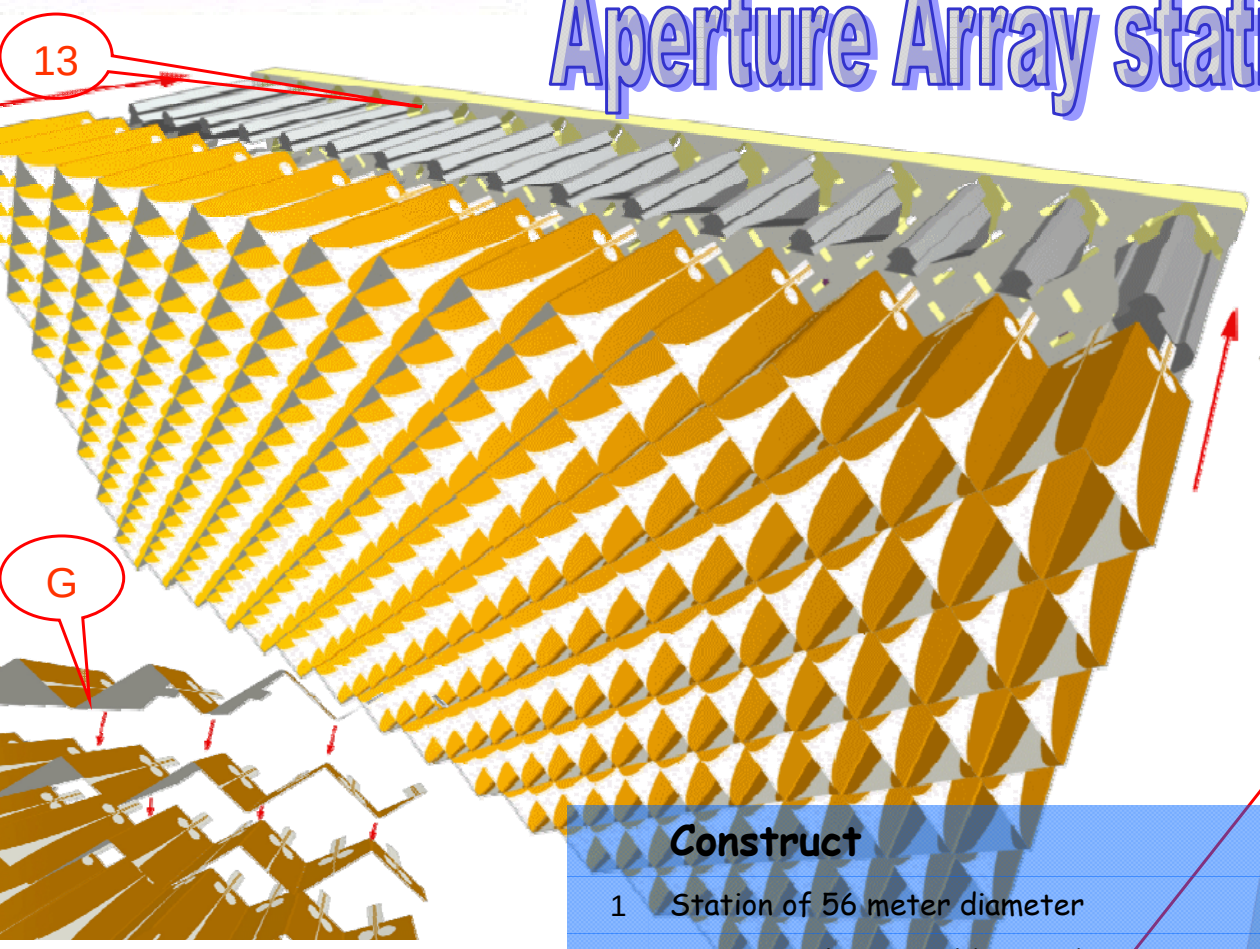
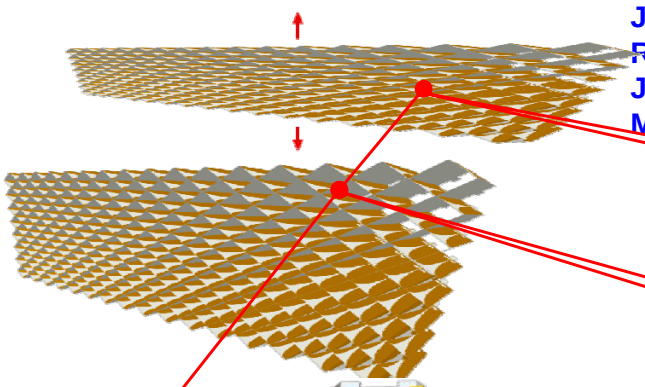
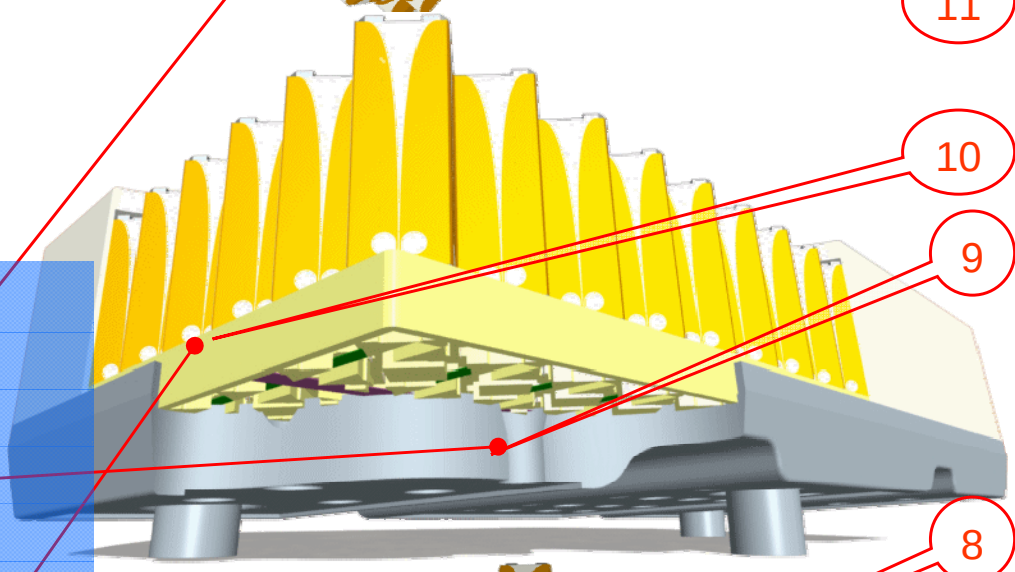
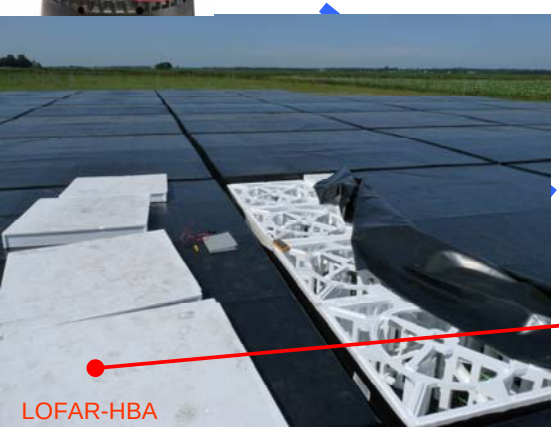
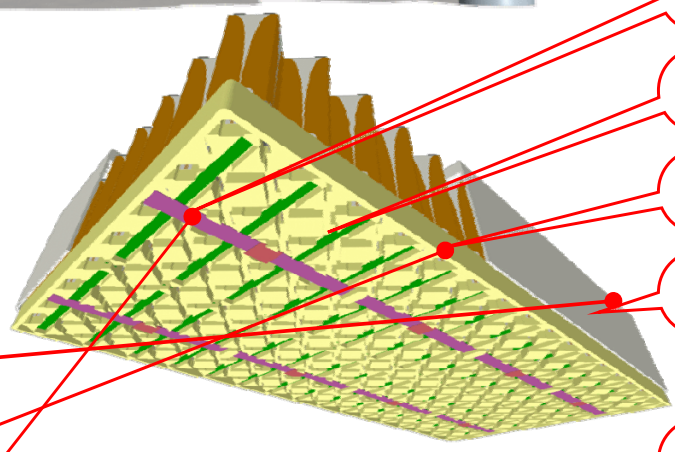
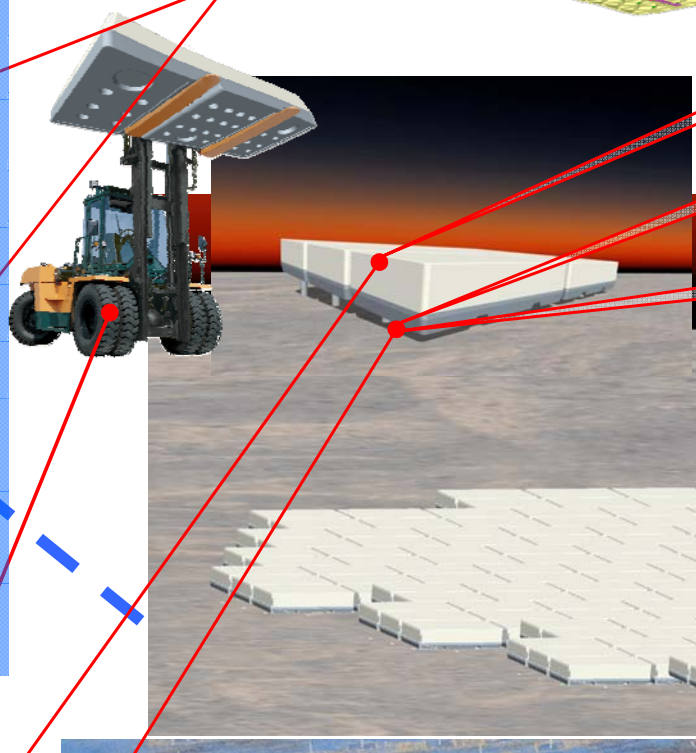










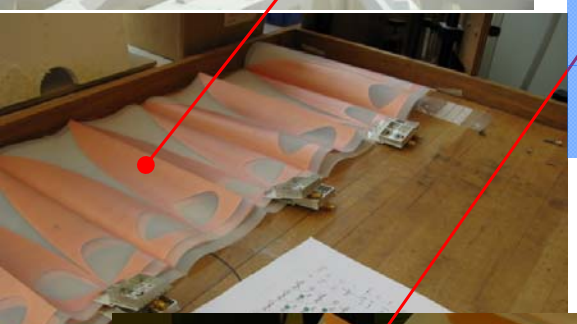


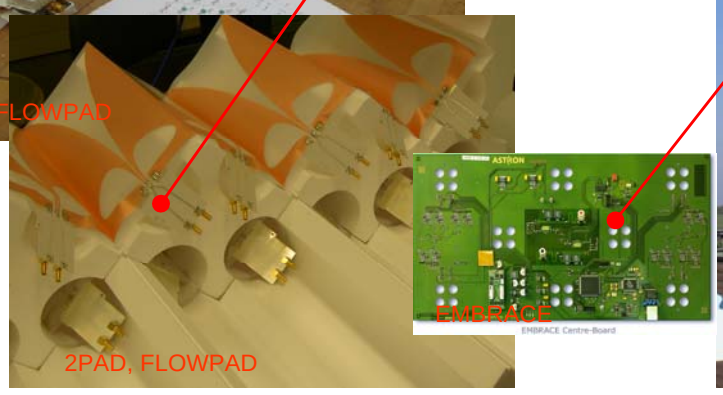
Construct

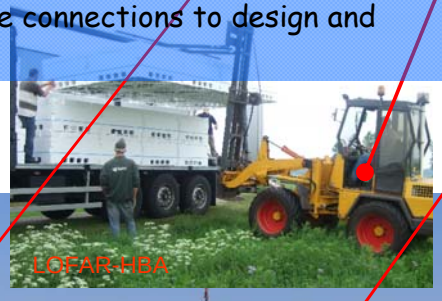
1	Station of 56 meter diameter
2	Passive cooling by cold ground
3	Three positioning pillars per tile
4	Tiles of 1.5 x 3 meter
5	Cover 1.5 x 3 m, PS Foam + EPDM foil
6	EPS foam base structure
7	RF Connection line on foil or boards
8	Central processing board
9	Bottom, plastic vacuum moulded
10	LNA mounted directly onto foil
11	Printed foil antennae, put on stretch
12	Huge folded antenna, unfolded for assembly
13	Metal groundplane, sputtering or metal foil

Define, Develop, Investigate

A	Station with 3 degree angle performance
B	Height position in steps over the station
C	Tiles electrical not coupled acceptable?
D	Thermal control to simulate and develop
E	RF connection line/connectors to develop (Industry)
F	Production automation, assembly process (Industry)
G	Foil to foil edge connections to design and test







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EXISTING DEMONSTRATORS

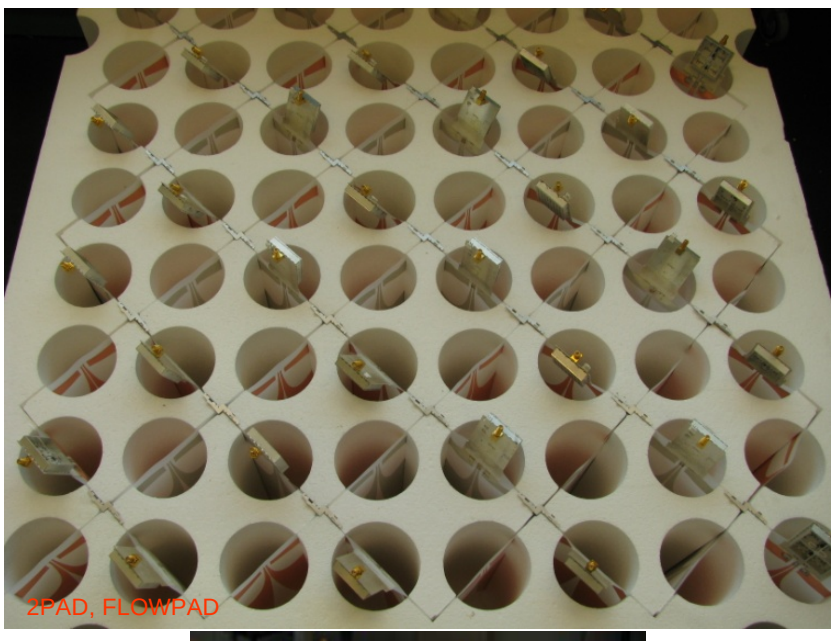
LOFAR-HBA, EMBRACE, APERTIF, 2PAD

LOFAR-HBA

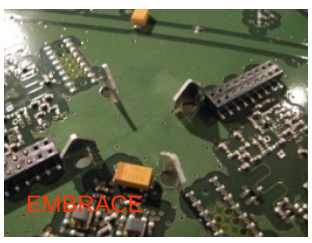
LOFAR-HBA

LOFAR-HBA

LOFAR


2PAD, FLOWPAD

2PAD, FLOWPAD


EMBRACE

EMBRACE

EMBRACE

APERTIF

APERTIF