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# An Autonomous Approach to Deinterleave and Recover Radar Pulse Sequences in an Unknown Maritime Environment

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► **To cite this version:**

Guillaume Martin, Salah Eddine Bouzid, Jean-Luc Alanic, Pascal Charge. An Autonomous Approach to Deinterleave and Recover Radar Pulse Sequences in an Unknown Maritime Environment. International Radar Conference, Nov 2023, Sydney, Australia. Paper ID: 279, 2023. hal-04185150

**HAL Id: hal-04185150**

**<https://hal.science/hal-04185150>**

Submitted on 13 Nov 2023

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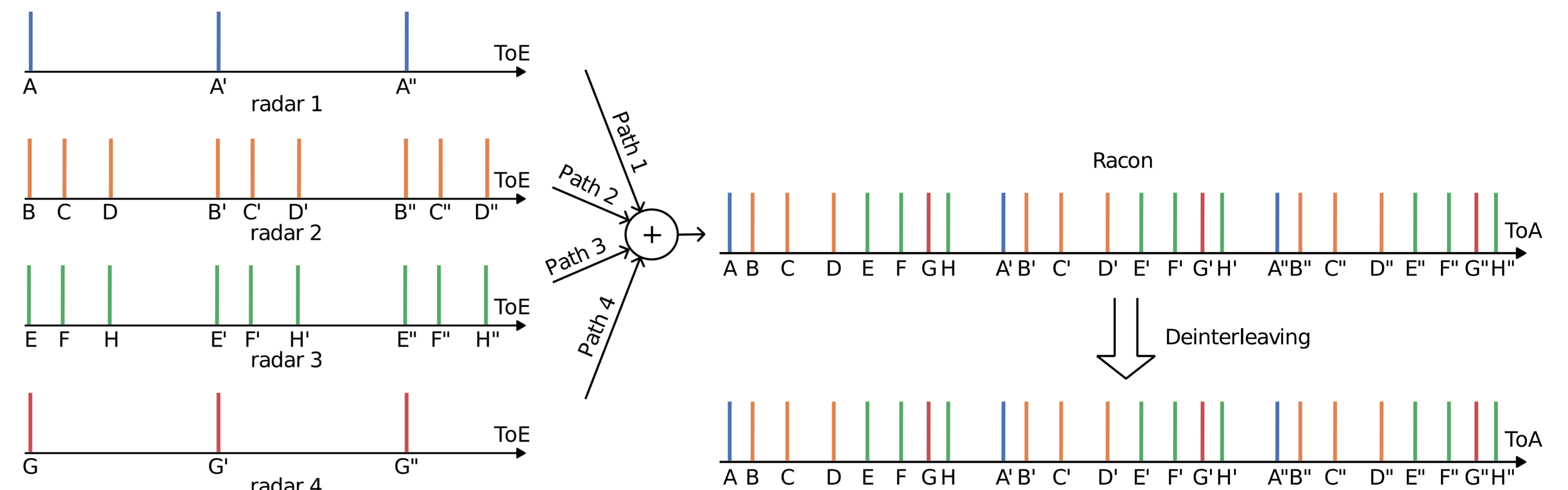
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## Context

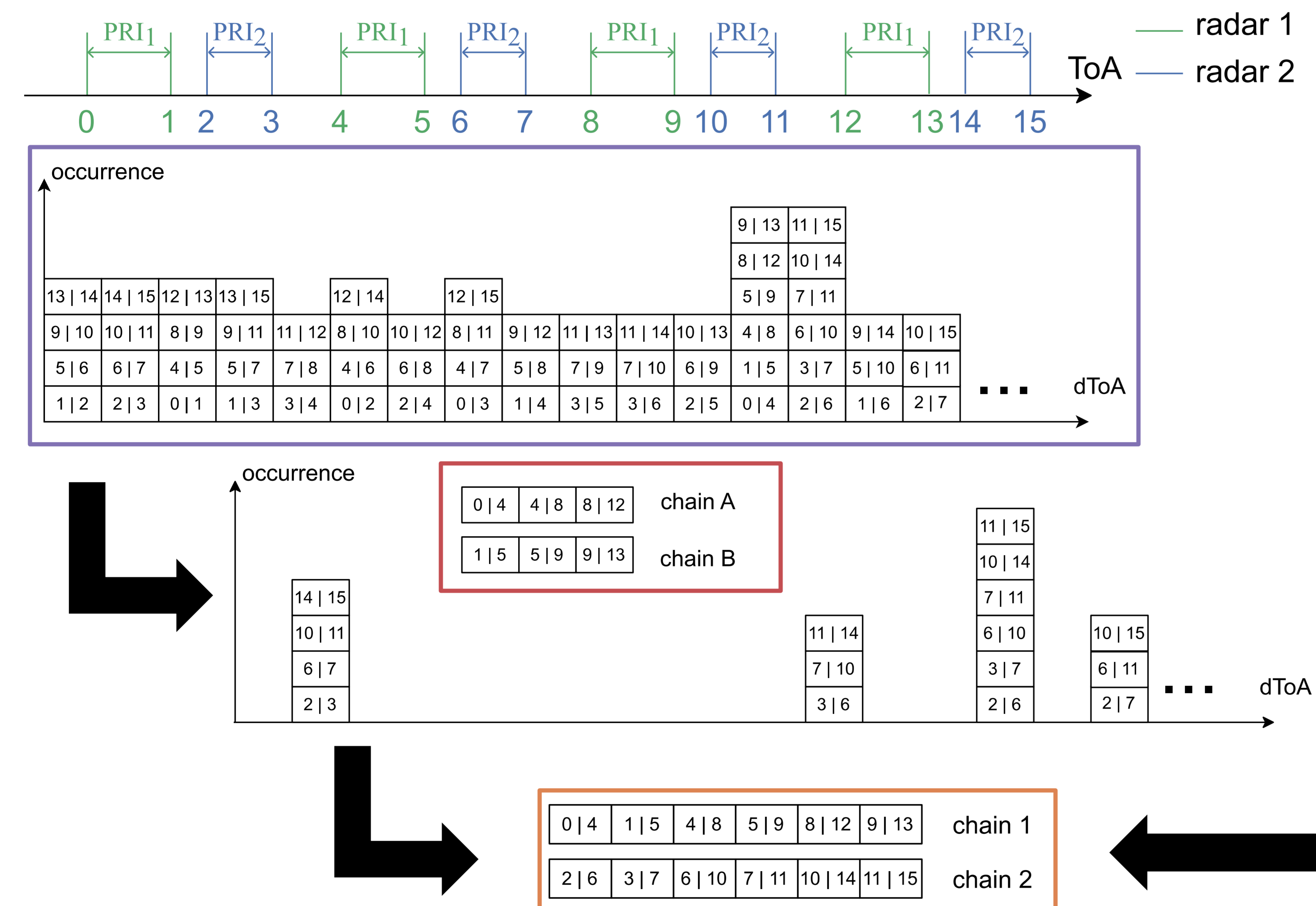
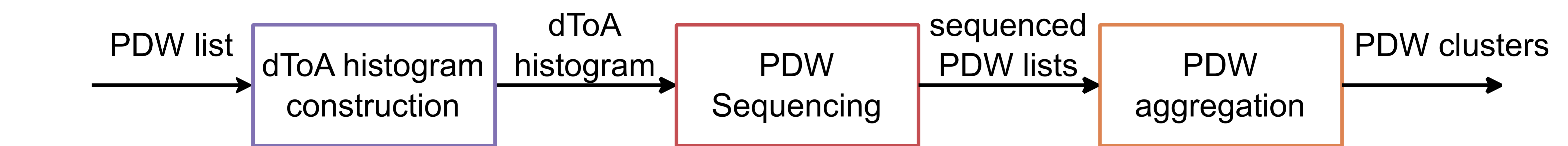
Radar technologies	Max power
Pulse radar	<b>kW</b>
Pulse compression radar	<b>W</b>
FMCW radar	<b>mW</b>



**How can you identify all radars, whatever their number or technology, even if they have the same characteristics, without any prior knowledge?**

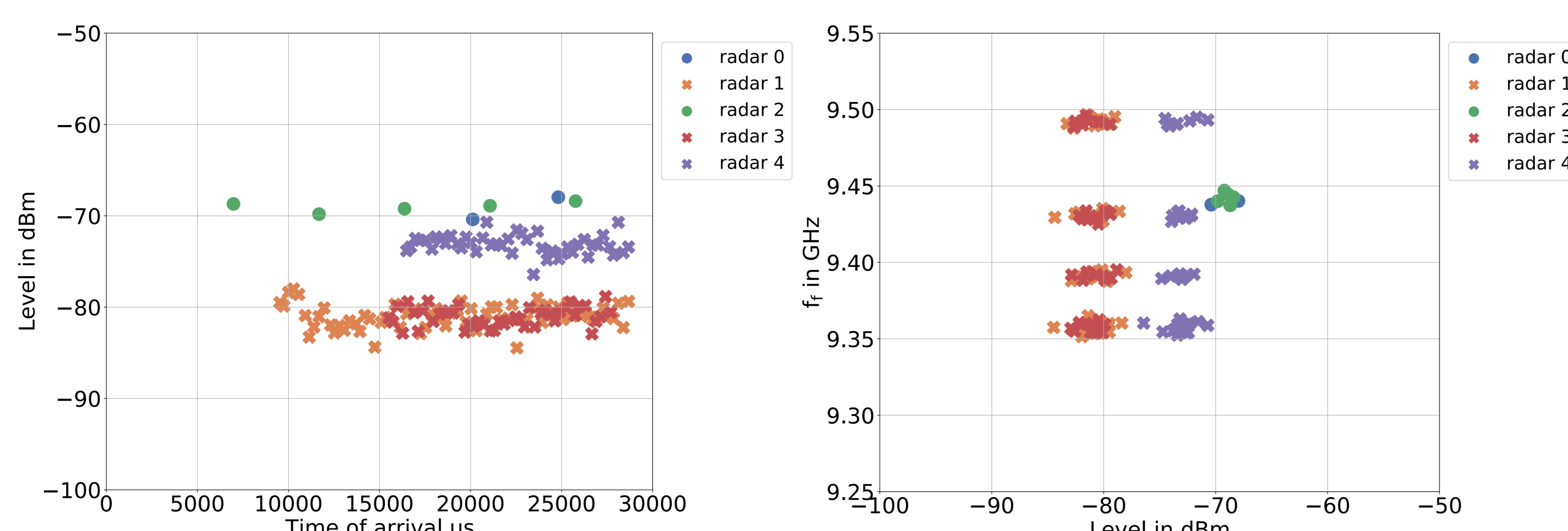
## Proposed Approach

$$PDW = [ToA, G, PW, f_f, f_m, f_b]$$



Criteria	Condition
Level criteria	Two PDWs from the same emitter have a similar level of emission
dToA criteria 1	PRI should be in the interval [T1, T2]
dToA criteria 2	Inter-pulse time between PDW from the same emission batch can only increase
Frequency criteria	PDWs from the same batch of emission have a different bandwidth
Pulse width criteria	The PDW with the highest ToA of a batch of emission has the largest PW

## Results



	Mean	Std
Homogeneity	98%	7%
Completeness	92%	14%

- Is an explainable artificial intelligence algorithm (**XAI**)
- Differentiates between radars with identical features
- Reconstructs pulse train of every radar without prior knowledge, regardless of the technology