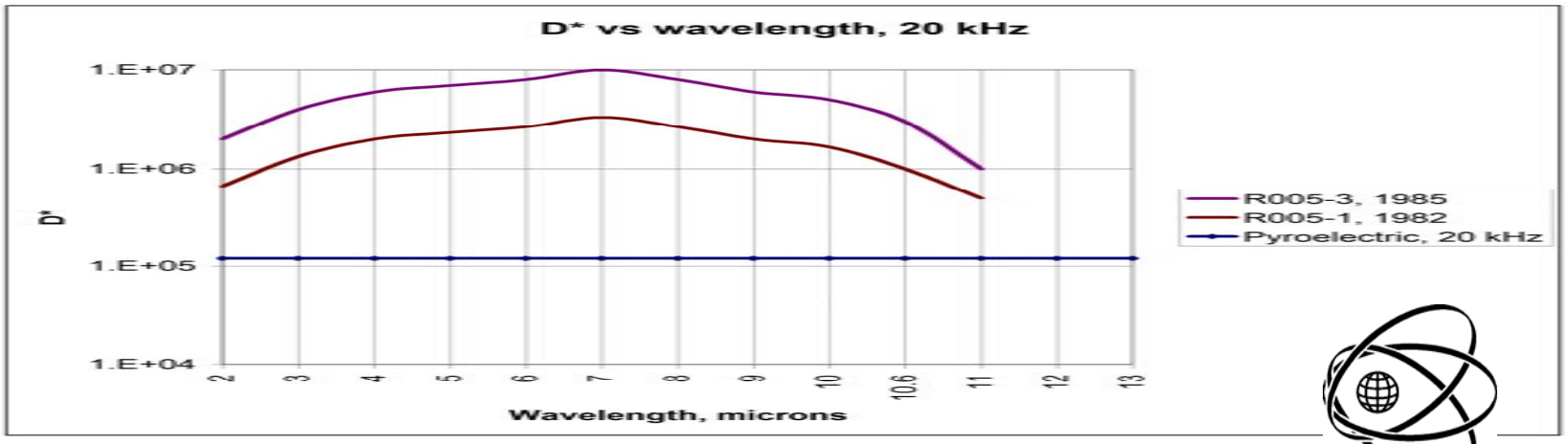
Room Temp MCT Improved

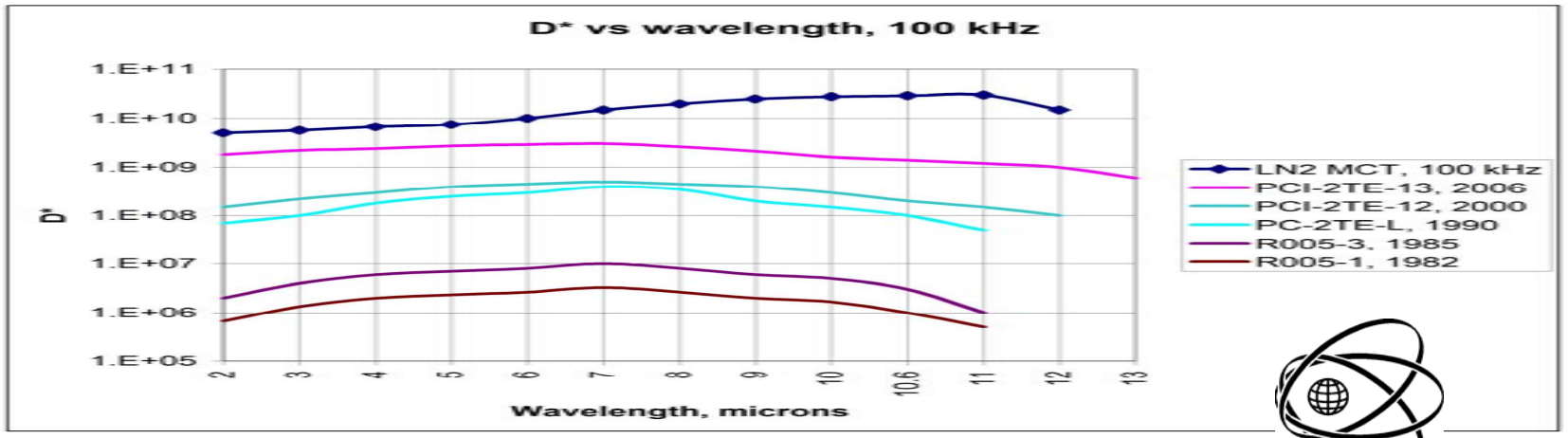
25 years of progress in room temp (and TE-cooled) HgCdTe

Rationale for first devices (1979)



- Only room temp device better than a thermal detector at mid- or high-frequency and > 4.5 μm

Time passed and performance improved

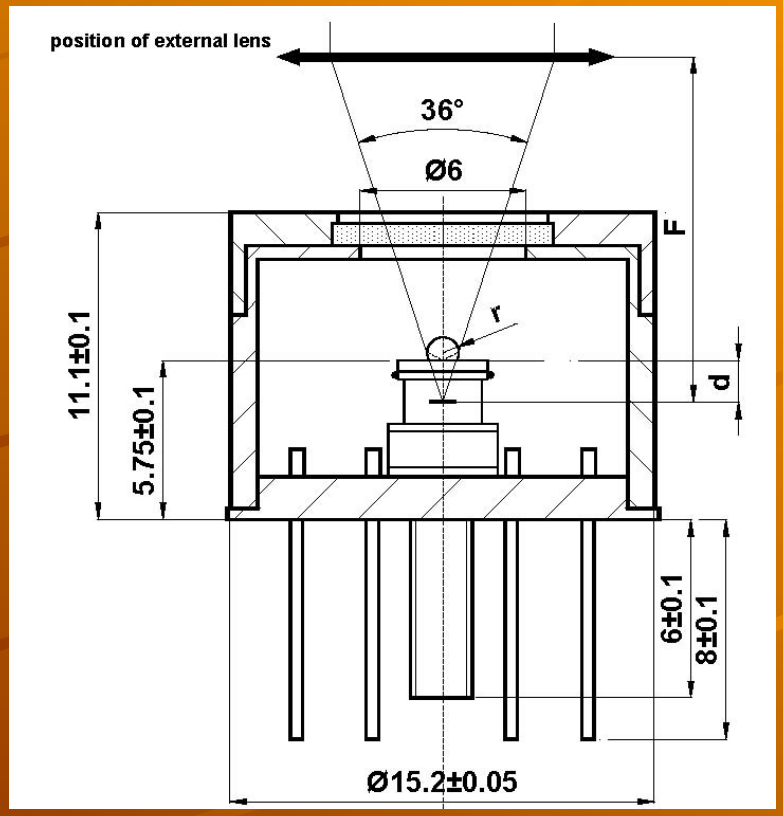


- This chart shows LWIR performance improvements since 1979 compared to LN_2 cooled photoconductive MCT – 100 kHz

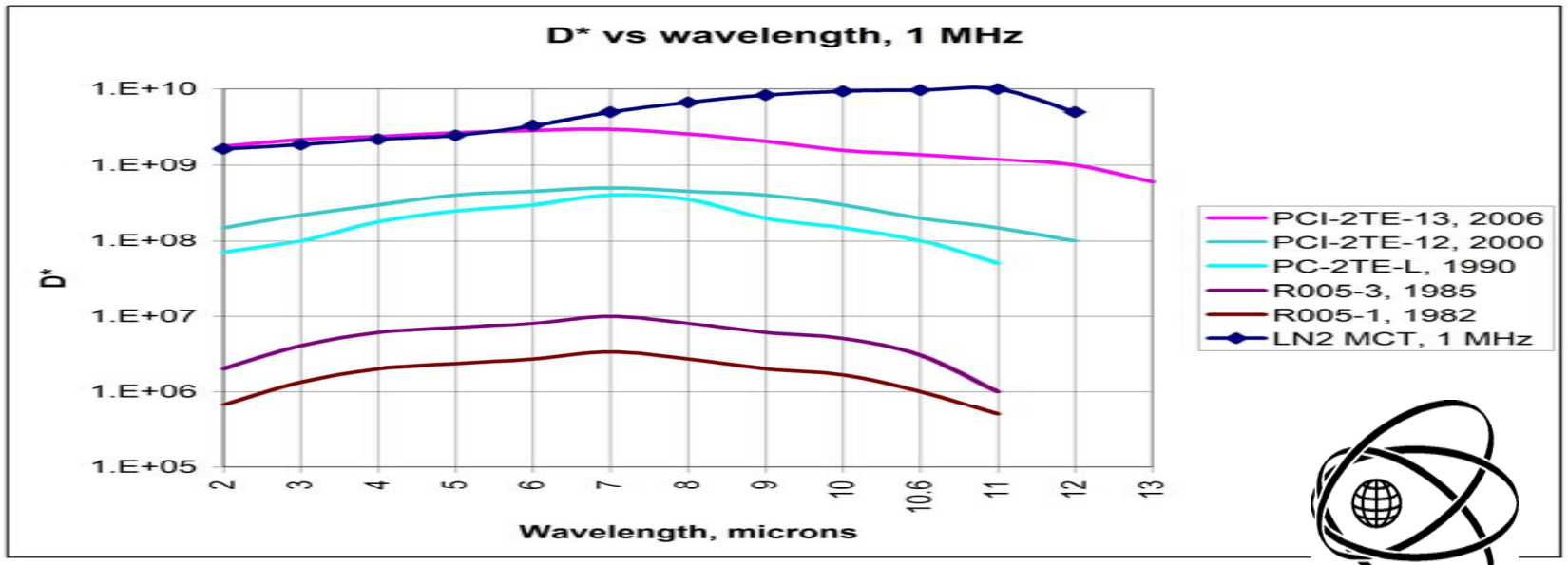
How do they do it?

- The key is improved materials and device architecture

Not just materials but TE coolers and immersion lenses contribute

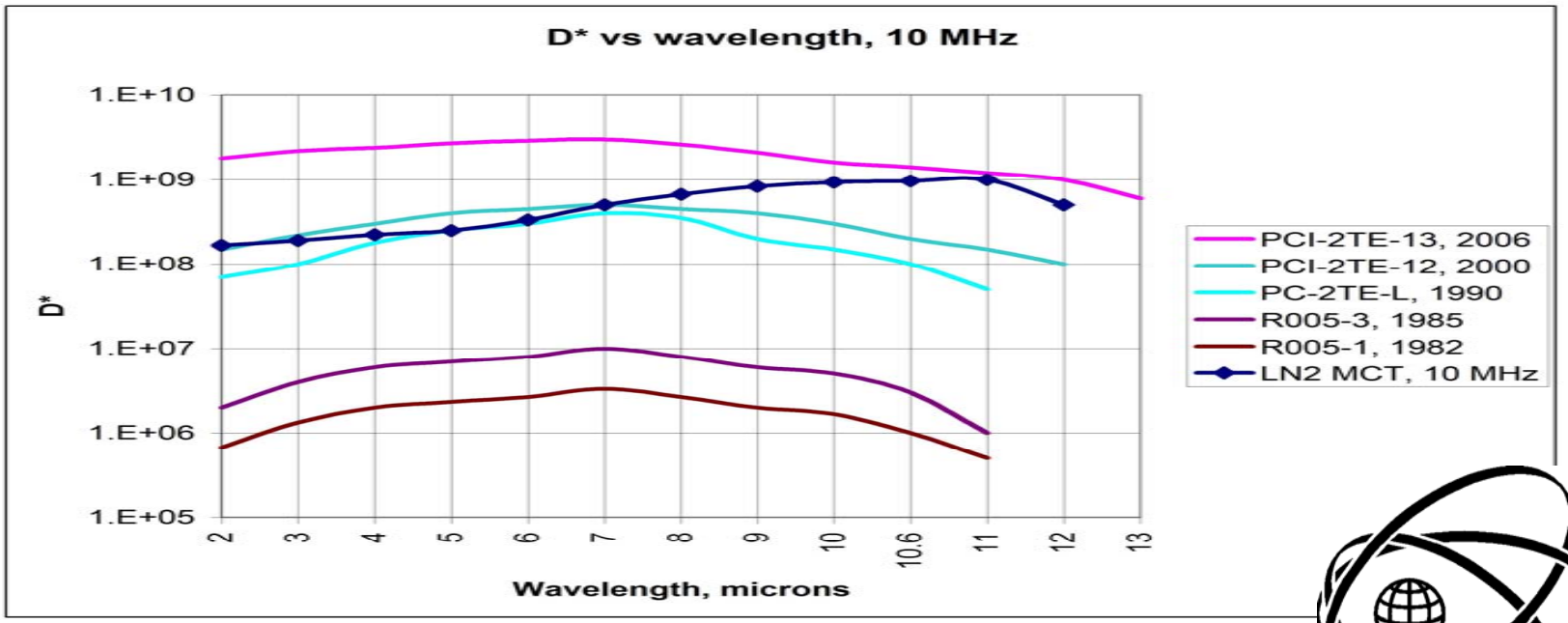


OK, but LN_2 MCT is still better



- Right, but not by much at 1 MHz

And TE-MCT is better at 10 MHz

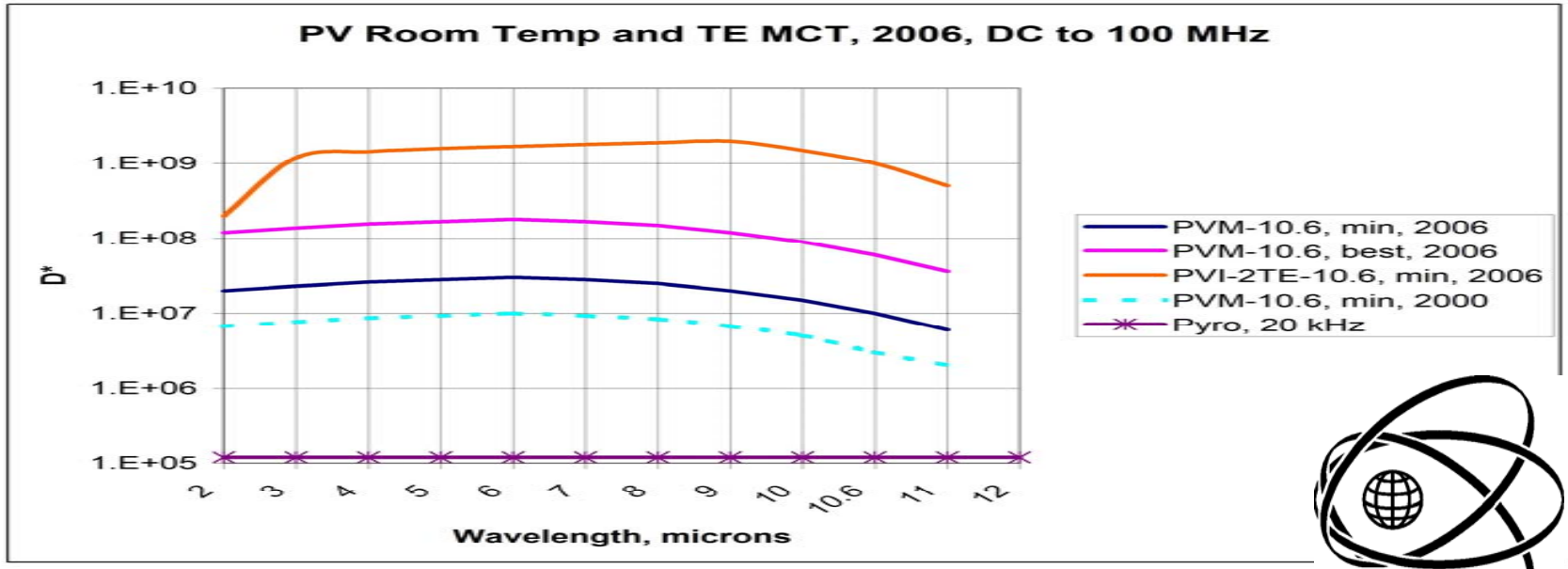


What about Photovoltaic MCT?

Advantages of PV devices

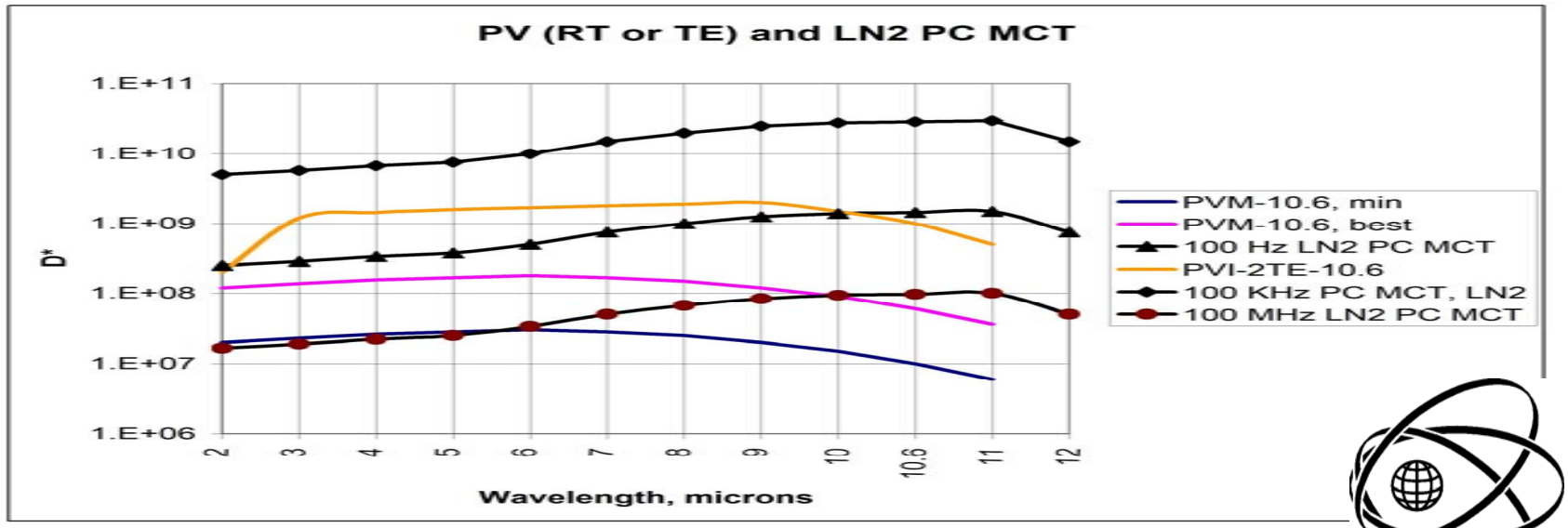
- No 1/f (flicker) noise – good DC to VHF
- No bias supply required
- Fast time constant – up to 1000 times faster than PC

PV devices at RT and TE-cooled



- Constant improvement is the message

And how do these compare to LN_2 PC MCT?



- Very well at low or high frequency, thanks, or when LN_2 inconvenient

To Conclude, it's getting better

- TE-cooled, immersed MCT is now within a factor of 10 in D* of LN_2 cooled PC MCT
- At low frequencies and at high frequencies, PV and/or PC TE-cooled immersed MCT are as good as or better in D* than LN_2 PC MCT
- New 3-stage coolers coming soon will further improve TE-device performance