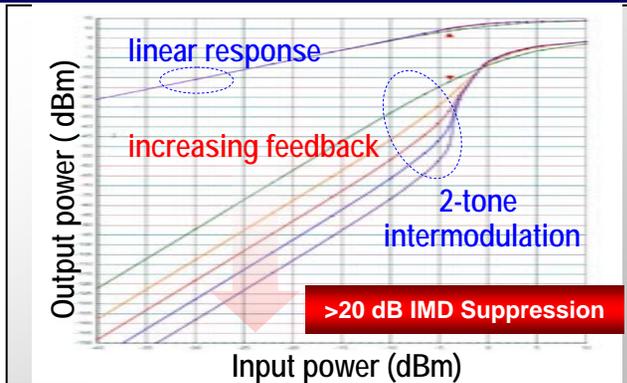




# Feedback Linearized Amplifiers for RF Electronics (FLARE)



**Strong Negative Feedback Greatly Reduces Distortion**

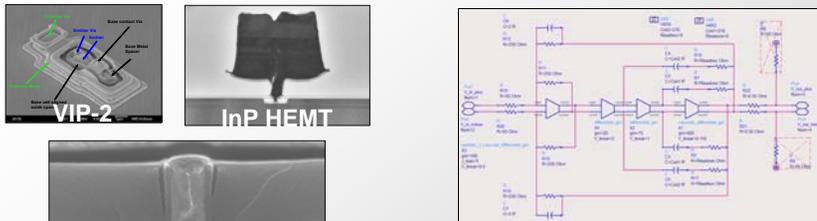


**Radical Improvement of RF amplifier OIP3 without additional DC power or noise figure degradation**

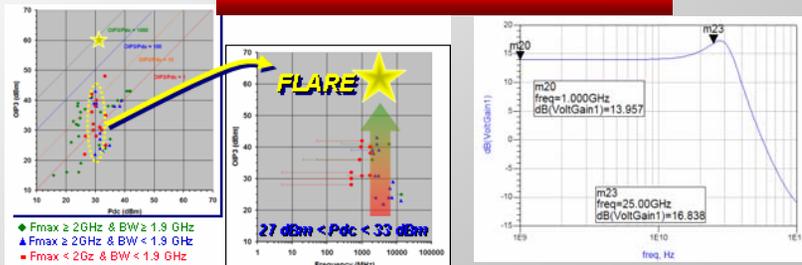
## • Goal

- Develop ultra-high-linearity low-noise feedback-linearized RF amplifiers:
  - Bandwidth: 100 MHz to 2 GHz
  - OIP3 @ 2 GHz > 60 dBm with PDC < 2 Watts
  - NF @ 2 GHz < 1.5 dB
  - Broadband gain > 20 dB

**+400 GHz InP Transistors & Nested Negative Feedback Loops**



**100X Increase in OIP3**



## • Technical Challenges

- Significant design challenges to achieving closed-loop stability around 100 GHz gain-bandwidth product nested loops
- IC processes and non-linear device models for integration levels required by nested feedback loops

## • Impact

- 100X increase in OIP3 of RF amplifiers without power or noise figure penalty can improve dynamic range and signal-to-noise ratio of RF electronics.
- Potential to enable greater stand-off for EW platforms and increased detection capabilities in the presence of RF interference
- Enhances performance of future military radar and communication systems