

IMPROVING BASE STATION AMPLIFIER PERFORMANCE

Unmet need

Power amplifiers are commonly used in radio transmission systems to provide increased signal power to a transmission antenna. For radio transmission, the amplifier generally has to make a trade-off between three parameters, efficiency, linearity and bandwidth. Improvements in any one of these, increases operating efficiency and reduces CapEx and OpEx associated with a base station.

Our Solution

In research undertaken by Dr Keith Finnerty and supported by Dr John Dooley and Dr Ronan Farrell of Maynooth University a signal processing stage for a base station amplifier was developed that operates on the principle that it is better to avoid non-linearity rather than the more complex process of correcting it. Their invention addresses two key issues with current outphasing amplifier designs: 1) rapid rate of change of input signal phase and 2) input signal dynamic range.

Rapid changes in phase causes bandwidth expansion (BER). In the invention, signal phase in the amplifiers non-linear region at lower amplitudes is modified, to create a more gradual rate of change of phase. The bandwidth reduction that occurs due to phase modification reduces

the requirements for frequency-flat high-precision components in the dual path transmitter required for outphasing. Reducing the requirement for dynamic range of the amplifier has the potential to allow for a reduction in the manufacturing tolerances required for an implemented system. In an outphasing amplifier, the requirement to balance each path of the amplification stage exactly can be reduced, leaving a more flexible design which could allow a wider bandwidth or more frequency flexible amplifier to be designed.

Development Stage

Stage 3. Prototype (bench demonstrator)

What is Sought

The technology and project needs development partners to collaborate with and/or license the technology so that it can be productised and commercialised.

Intellectual Property

Patent application (unpublished), knowledge and know-how.

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Development Stages of Opportunities

