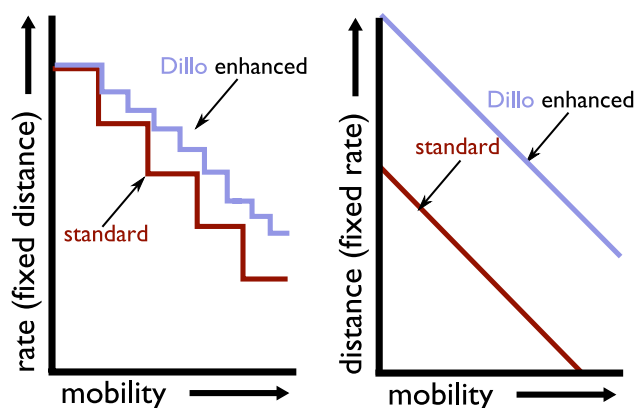


Dillo for Stressed OFDM Wireless Links

To meet the ever-increasing data demands from wireless applications in both defense and civilian deployments, the spectrum over which modern wireless networks operate continues to grow. Broad spectrum links, however, result in increased dispersion effects on the wirelessly transmitted signals. To deal with this challenging problem, engineers have turned to orthogonal frequency division multiplexing (OFDM) modulation technology due to its ability to remove broadband signal dispersion effects in an efficient manner.

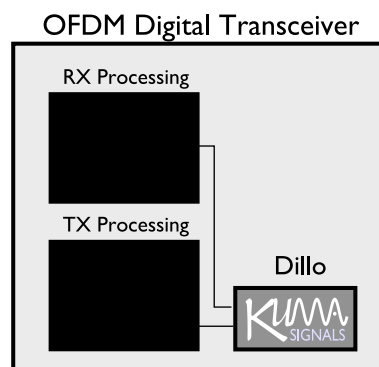
Current OFDM wireless systems, i.e., Wi-Fi, WiMax, and 3GPP-LTE, have shown an increased sensitivity to mobility (Doppler effects) in the wireless environment. The performance of OFDM is particularly sensitive to rapid movement of the transmitter, receiver, or objects around the transmitter and receiver. In some communication environments, this Doppler sensitivity can result in complete link failure even when an otherwise adequate signal strength is observed. As illustrated below, effectively, we observe that increasing mobility in the wireless environment results in lost data rate and transmission range.



Kuma's Dillo technology mitigates the detrimental effects of Doppler. Additionally, not only is OFDM able to tolerate more mobility in the system, but the transmission range and data rate are enhanced for virtually all mobility scenarios, even zero mobility. This makes Dillo technology ideal in stressed environments that experience high loss (e.g., path loss, interference, hardware malfunction, etc.) and high mobility.

Although the performance enhancements offered by Dillo are favorable, its integrative ability is equally impressive. Current wireless digital transceiver designs do not need to be modified significantly. Essentially, Kuma Signals' Dillo technology can be strate-

gically placed in current transceivers, with minimal modification, to offer robustness in stressed environments. Because Dillo is an all-digital solution, it also offers negligible effects on power drain and device space.



Specific applications of Dillo include increased coverage of wireless infrastructure, increased tolerance to interference in adjacent networks, and increased tolerance of mobility. In commercial wireless deployments (e.g., Wi-Fi hotspots, cellular base stations, etc.) providers will exploit Dillo technology to reach more users with more reliability without changes in hardware. In military and defense applications, Dillo technology enables the Warfighter to stay connected to broadband information networks in a large range of operating scenarios, including those that may lead to compromised links.

Dillo Technology Summary

- Increase high-rate WiMax Doppler tolerance from train speeds to supersonic jet speeds
- Extend Wi-Fi connectivity range up to 1000 m without changes in hardware or digital design
- Allow Wi-Fi/WiMax to tolerate interference signals up to 25x stronger than desired signal
- Low complexity, simple integration with current OFDM systems (e.g. Wi-Fi, WiMax, JTRS OFDM waveform)
- For more information, please contact Kuma Signals representatives at info@kumasignals.com