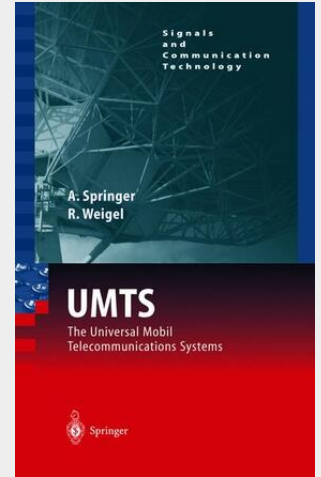


UMTS

The Physical Layer of the Universal Mobile Telecommunications System

It took more than 15 years of research, standardization work, and development with an enormous effort of manpower to bring third generation (3G) wireless communication systems to life. The first research work on 3G systems started around 1988 [1]. At this time the striking success of second generation (2G) systems, especially of GSM (Global System for Mobile Communications), was not yet evident. A substantial part of these early research activities took place in Europe and was sponsored by the European Commission in the course of research programs such as: Research and Development of Advanced Communications Technologies in Europe (RACE-I, RACE-2) and Advanced Communications Technology and Services (ACTS) [2]. Even before these activities, 3G systems were considered in 1992 at the WARC (World Administrative Radio Conference), where 230 MHz of spectrum around 2 GHz was identified for 3G, and in standardization bodies like the ITU (International Telecommunications Union) from a global perspective and ETSI (European Telecommunications Standards Institute) in Europe. At the present time 3G networks are deployed or are already operating (e. g., in Japan the first commercial 3G system started its service in October 2001). Unfortunately, the initial idea to create one single 3G standard to allow for seamless world-wide roaming could not be realized. However, three of the five members of the so-called IMT-2000 (International Mobile Telecommunications, the official acronym for 3G systems) family of standards are based on Wideband-CDMA (Code Division Multiple Access).

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