

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Fixed and Broadcast Communications (2)

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AN HD-TV DIRECT-TO-HOME BROADCASTING SATELLITE SYSTEM IN KA-BAND OVER
EUROPE

Abstract

The 21.4 – 22 GHz frequency band in the Ka-band is allocated to the Broadcasting Satellite Service (BSS) over Europe. This frequency band could be the expected opportunity to increase the orbital-spectrum resource over Europe for the TV Direct-to-Home (DTH) broadcasting market. Indeed, the recent development of High Definition TV (HD-TV) and the expected emergence of 3-Dimension TV (3D-TV), which both require very high data rate transmission, could trigger penury of spectrum-orbit resource over Europe. Unfortunately the Ka-band suffers from two severe drawbacks: a higher free-space propagation loss and heavy fading in rainy regions. More, the novelty of the Ka-band technologies usually means lower performances. In brief, HD-TV DTH broadcasting in Ka-band over Europe shall require more satellite resources (more bandwidth and more radio power per TV channel) than Standard Definition TV (SD-TV) broadcasting in the Ku-band [11.7 –12.5 GHz]. Nevertheless, technical solutions exist to design Ka-band BSS satellites offering a similar capacity in number of TV channels as the existing Ku-band BSS satellites. The paper analyses the challenges of HD-TV broadcasting in the Ka-band over Europe and presents the technical solutions to overcome these challenges. Then a complete satellite system for HD-TV broadcasting services is described and assessed.