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Fraunhofer Institut Integrierte Schaltungen

DARS System System Engineering

Simulation Plan Work Package 21B

DARS-FHG-FSDC-721-140000

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| Name | Responsibility | Date | Signature |
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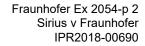
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2 Scope

The method "split 3/8 convolutional code" was added to the simulation work package 21 (= diversity combining before/within Viterbi).

This document shall describe the additional work items related to this subject.

3 Related Documents

[RD1] DARS-FHG-FDDB-630-140000 Simulation Plan

[RD2] Simulation Work Package 21: Two TDM Diversity (STEL document, no document number available)

[RD3] E. Eberlein: Memo "Diversity Combining within Viterbi", 26/10/98



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4 Work package Description

It is proposed to perform the work in the following steps:

- Step 1: Theoretical analysis (e.g. literature search)
- Step 2: Validation at broadcast channel level using SV2 data
- Step 2B (if necessary): validation including full TDM If the weighting is based on the broadcast channel and/or level information (e.g. AGC values) only this step is not required. A simulation setup using
- Step 3: Validation with additional channel parameters using the multi-state satellite channel model.

After step 2 a first estimate of the gain for different SV2 scenarios shall be available. Step 2B and 3 may help for further optimization. Step 1 and 2 shall be finalized until beginning of December. The results of phase 2B and 3 shall be available for the CDR meeting.

4.1 Theoretical analysis (Step 1)

The proposed algorithms shall be analyzed in theory first. The analysis shall give the expected performance for different scenarios. If the performance can't be estimated in theory the critical parameters for the simulation shall be identified.

The following questions shall be addressed during the analysis:

- Puncturing pattern
- Gain for different scenarios: The gain can be estimated by comparing the method to the performance of a QPSK system with time interleaver and code rate 3/8 for a Rician channel.
- Overall gain (e.g. service availability for the scenario "Kurt-Schuhmacher Strasse" as function of the link margin -> the required link margin can be defined for a required service availability).
- Viterbi decoder implementation
 - Survivor length
 - metric calculation
- Channel state estimation
 - Required time resolution
 - Signal quality estimation algorithms based on:
 - QPSK scatter (at output of demod) Fraunhofer Ex 2054-p 5 Sirius v Fraunhofer IPR2018-00690



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