Release note for SEAMCAT version 5.5.0

Issue Type	Issue key	Summary	Component/s	Calc
Bug	SMG#80	EHata - indoor to indoor propagation within same building with height difference of Tx and Rx distance calculation correction	PMP	+
Enh	SMG#74	Scenario - relative positioning - adjustment of positioning when reference cell is not set at the centre of the cluster	Scenario/Positioning	+
New feature	SMG#78	Implementation of PMP according to Recommendation ITU-R P.2001.4	PMP	+
New feature	SMG#77	Implementation of PMP according to Recommendation ITU-R P.1411-11	PMP	+
New feature	SMG#76	Implementation of PMP according to Recommendation ITU-R P.528-5	PMP	+
New feature	SMG#79	Implementation of clutter loss according to Recommendation ITU-R P.2108-1	PMP	+
Enh	SMG#83	Antenna pattern F.699 – taking frequency and other settings from the environment, calculating and updating Antenna peak gain on fields change	AGP	-
Enh	SMG#82	Antenna pattern S.465 - taking frequency and other settings from the environment, calculating and updating Antenna peak gain on fields change	AGP	-
New feature	SMG#75	AAS sub-array model - AGP plugin – first implementation of active beamforming antennas with sub-array model	AGP	+
Enh	SMG#81	Display issues - v.5.4.2 – power control outline display	UI event display	-
Bug	SMG#84	Tri sector gain issue – correcting issues with displayed values and calculated gain on 2nd and 3rd sector for 3 sector beamforming antenna	AGP	+
Enh	SMG#45	Receiver Intermodulation interference – incorporating VLT spectrum emission mask in ILT ensemble calculations, extension of frequency domain vector, refining weak non-linearity check	EPP	+
Enh	SMG#79	PMP ITU-R P.2108-1 §3.1 adjustments in calculation for applying clutter hight in calculation of basic transmission loss and GUI adjustments	PMP	+
Enh	SMG#95	IMT 2020 the base station tilt and offset randomisation correction (needs only be randomized per creation of each base station sector)	Cellular systems/IMT-2020	+
Bug	SMG#73	Correction in calculations of capacity loss of CDMA DL	Cellular systems/IMT-2020	+
Enh	SMG#81	Enhancing display in simulation results presenting power control values and ICE shows last result after calculation	Results	-

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Enh	SMG#89	EPP-11 enhancements to also output: elevation angle for each selected link and position (X,Y,Z) of each selected component	EPP	-
Enh	SMG#37	Extending features of SEAMCAT Command line functionality to possible to export all result vectors and user interactivity added	CommandLine	-
Bug	SMG#88	Correction in calculation of noise calculation in SINR calculation and capacity loss calculations in IMT-2020 micro cell systems	Cellular systems/IMT-2020 Micro cell	+
New feature	SMG#75	AAS sub-array model - AGP plugin – enhancing implementation and new features for active beamforming antennas with sub-array model	AGP	+
Enh	SMG#84	Enhancing azimuth results display in event results section	AGP	-
Enh	SMG#93	Enhancement in handling and display of elevation angles consistent with azimuth enhancements	Scenario / positioning	-
Enh	SMG#90	Event results naming vectors enhancements	Results	
New feature	SMG#87	Implementation of new PMP according to Recommendation ITU-R P.452-17	PMP	+
Enh	SMG#12	Enhancements in Antenna Gain Plot tool and Antenna Comparison Tool	AGP	-
Enh	SMG#86 SMG#29	Beamforming antenna (Recommendation ITU-R M.2101) – library enhancement, applying unit tests	AGP	-
New feature	SMG#45	Receiver intermodulation enhancement for weak non-linearity trigger level and applying condition check	EPP	+
New feature	SMG#47	Implementation of terrain profiles for use in combination with PMP (Jira) – Implementation of terrain path profile in simulation for system and interfering links (extracting profiles and calculation of signal vectors using terrain propagation loss), including terrain in ICE	Configuration, Systems, Scenario settings, Simulation, ICE	+
New feature	SMG#47	Implementation of terrain profiles for use in combination with PMP (Jira) – Implementation of terrain path profile in Tools (Terrain profile tool and Test propagation model tool)	Tools	+
New feature	SMG#47	Implementation of terrain profiles for use in combination with PMP (Jira) – modifying EPP 1 to extract geographical positions and propagation loss, modifying RxIM, Cognitive radio to include terrain calculations	EPP	+
Bug	SMG#99	OFDMA DL achieved bitrate calculation correction	OFDMA DL	+
New feature	SMG#75 SMG#29	AAS sub-array model - AGP plugin – enhancing implementation for uncorrelated case, unit tests for AGP	AGP	+
Enh	SMG#94	Cognitive Radio improvement - a new LinkResult is produced: ILT -> VLT enabling that Link to be inspectable in the EventResultPlot.	CR	+

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Enh	SMG#88	Correction in calculation of noise calculation in SINR calculation and capacity loss calculations in IMT-2020 micro cell systems – correcting in uplink direction, naming and correcting positioning	Cellular systems/IMT-2020 Micro cell	+
Enh	SMG#89	EPP-11 enhancements – export to file all vectors generated (also for different kind of vectors)	EPP	-
New feature	SMG#96	Reorganising AGP Library to have Beamforming Library group and display of antenna pattern in selecting antenna from Library	AGP	-
Enh	SMG#86	Beamforming Antenna (Recommendation ITU-R M.2101-0) – presenting full pattern in Event results for system and interfering links instead envelope, change display when steering angle changes	AGP	
Enh	SMG#93	Elevation angles – fixing antenna elevation flip in display on Rx side	Scenario / positioning	-
Enh	SMG#97	Update log4j to 2.17.1 – app security enhancement	Backend	-
Eng	SMG#92	Apple M1 processor issue - propagation model P.452	Backend	-
New feature	SMG#45	Receiver intermodulation enhancements including VLT in ensemble and weak non-linearity enhancement in line with SE21 LS	EPP	+
Bug	SMG#101	PMP Longley Rice input handling in propagation test and simulation	PMP	+
Enh	SMG#98	V5.4.3A3 Test issues identified – event display enhancements, outline display enhancements, loading older workspaces, resolving idle or crash for some workspaces	Systems, Results	-
New feature	SMG#47	Implementation of terrain profiles for use in combination with PMP (Jira) – implementation of SRTM3 ARCSEC DEM support, distance shift of transmission loss in TPT by one resolution step, void fill of missing DEM data by using last “valid” height in profile in SRTM1 and SRTM3, solving MacOS Tile loading issue on >100 km profiles, adding notes for clutter and void filling method in terrain PMP	Configuration, Systems, Scenario settings, Simulation, ICE	+
Bug	SMG#105	Scenario GUI – Frequency of victim system in scenario when system settings is changed	GUI	-
Enh	SMG#106	Compare workspaces tool settings and comparison feature improvements – workspace inheritance, updating workspaces, add and delete workspace, type of system display, compare same interfering links, better compare function functionality	Tools	-
Enh	SMG#105	V5.4.3A4 Test issues identified – Tx & Rx libraries re-introduce, debug output file format fix, greying our IM rejection in Generic, fixing issue with NaN in blocking, IMT-2020 UL Noise calculation correction in SINR	Systems, Results	+

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Enh	SMG#88	IMT-2020 MicroCell UL – bitrate percentage loss display for micro-cell ul, frequency update in IMT-2020 UL calculation	Cellular/ IMT-2020	+
Bug	SMG#100	ILT power in VLR bandwidth for IMT-2020 DL as interferer - handling bandwidth corrections correctly. Tx power setting is including bandwidth correction. New interface for using system frequency in unwanted	Cellular/ IMT-2020	+
Bug	SMG#107	PMP Longley-Rice fix to use Free space propagation loss if calculated value less than FS	PMP	+
Enh / new feature	SMG#47	PMP enhancement using terrain profile heights in calculation of transmission loss according to Recommendation ITU-R P.452.17	PMP	+
Enh	SMG#102	Removal of the intermodulation rejection mask from the Library as these settings are not used	Library	-
Test	SMG#100	Implement tests for IMT-2020 DL calculation of ILT power in VLR bandwidth and BS Tx power for interfering links	Cellular/ IMT-2020	-
Bug	SMG#113	Vector median value calculation correction for bitrate vectors (infinity issue resolved)	General	-
Enh	SMG#75	Beamforming Sub-Array changes in UI, calculating values of Gain and Vertical spacing with change, updating element antenna; Separating Element antenna classes - one for Beamforming Sub-Array and second for Beamforming Composite and 3GPP TR 36.814	AGP Beamforming	-
Enh	SMG#108	EPP1 export all functionality enhancement, Select All / Remove All button functionality improvements; if Victim System is not selected, also results for Interfering System Links are not shown – fix that results for 3 types of systems are shown independently.	EPP	-
New feature	SMG#112	Terrain data reader support of new formats – adding functionality of data reader for SRTM 1 arc second bil files in ver2 and SRTM 3 arc second bil files in ver2	Configuration, Systems, Scenario settings, Simulation, ICE	+
Enh / new feature	SMG#78	PMP enhancement using terrain profile heights in calculation of transmission loss according to Recommendation ITU-R P.2001.4	PMP	+
New feature	SMG#111	Terrain consistency check – implementation of functionality for consistency check of availability of terrain data needed for simulation of interference scenario and reporting this to user – first implementation.	Simulation, Consistency check	-
New feature	SMG#116	Extension of CommandLine application to use terrain profile data in simulations, controls of missing tformat, tpath data and wrong format. Modifying Command line to take terrain settings from workspace if not specified in CL	CommandLine application	+

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New feature	SMG#107	PMP Irregular Terrain Model - Longley-Rice implementation of new PMP ITM inheriting NTIA reference implementation	PMP	+
New feature	SMG#109	Terrain profiles – enabling using terrain functionality for external PMP and EPP	Model	+
New feature	SMG#121	Implement new EPP15 for extracting Terrain profiles from simulation, collect and display terrain data, height profile and transmission loss	EPP	+
New feature	SMG#125	Polarization in PMP P.452 with terrain profile	PMP	-
Bug	SMG#123	Fixing issue calculation of attenuation in PMP ITU-R P.528-5 (0 dB transmission loss for some settings)	PMP	+
New feature	SMG#47	Extending workspace settings / terrain settings with terrain format and terrain path, saving terrain settings to workspace & loading, additional buttons to propagate changes from scenario terrain settings (path and format of terrain data) to the configuration and also to revert the changes in terrain settings to ones in configuration.	Configuration, Systems, Scenario settings, Simulation	+
Enh	SMG#112	Change terrain format names for consistency in SEAMCAT Application and CommandLine	General	-
Enh	SMG#116	CommandLine when result path not mentioned create result on workspace directory, fix case and lower case for CommandLine keys	CommandLine application	-
Enh	SMG#111	Inform user on error if terrain format is not correct, dynamically check the list of tiles not found on folder	Simulation, Consistency check	-
Enh	SMG#124	Introducing VLR as reference point in ISL terrain settings	Simulation, Terrain	+
Bug	SMG#124	TerrainHelper – fixing issue with VLR as reference point in ISL and NullPointer exception when running terrain	Simulation, Terrain	+
Bug	SMG#80	EHata – indoor same building probability correction of distribution used and adjusting Tests	PMP	+
New feature	SMG#112	SEAMCAT Terrain - Implementing new Terrain data reader for Aster GeoTif digital terrain data model, introducing Unit tests for Aster GeoTif reader	PMP, Terrain	+
New feature	SMG#112	SEAMCAT Terrain - Implementing consistency check for Aster GeoTif digital terrain data model to identify needed DEM Tiles	PMP, Terrain	+
Bug	SMG#127	IMT-2020 UL azimuth pointing and sector antenna rotation in second and third sector correction for sectorial layout, correction of antenna azimuth and gain	IMT-2020	+
Bug	SMG#128	Fixing calculation of Maximal Achievable bitrate and Achievable bitrate in cellular systems to take correct BW factor in IMT-2020 UL/DL & OFDMA UL systems	IMT-2020, OFDMA UL	+

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Enh	SMG#128	Adding tests for System and Reference cell average bitrate loss in IMT-2020 UL/DL & OFDMA UL/DL	IMT-2020, OFDMA	-
Enh	SMG#132	Tools enhancements – enhancement of graph selection and consistent colouring in plotting multiple vectors (e.g. Compare vectors, Propagation Test Tool):	Tools, Vector graphs	-
Enh	SMG#132	Tools enhancements – enhancement of Antenna comparison tool for AGP to have duplication button and interactive selection of antennas with check box	Tools, AGP	-
Enh	SMG#133	Enhancement user friendliness of the Save as functionality to propose the original filename in the field for editing	Generic, UI	-
Enh	SMG#132	Tools enhancements – enhancement of manual setting of seed value in Test Distribution tool	Tools	-
Enh	SMG#130	Radio-Climatic Zones – adding note on using Indoor zone type to the PMP ITU-R P-2001-x, ITU-R P 452-X	PMP	-
Enh	SMG#47	Renaming Map Coordinate in terrain settings to Reference component	Scenario Terrain settings	-
Enh	SMG#37	Command line result export to file enhancement to sort result vectors extracted	Command line	-
Enh	SMG#129	Scenario positioning UI settings – re-organise options in the single panel, renaming mode “None” to “Standard”	Scenario settings	-
Enh	SMG#129	Simplify “Co-location configuration” Including it as an option on “Position Relative to” under “Correlated” Mode where applicable.	Scenario settings	-
New feature	SMG#129	Scenario relative positioning UI settings, extending relative positioning functionality for co-location configuration to include positioning VLT and VLR relative to ILT and ILR for Generic systems	Scenario settings, co-location	+
New feature	SMG#134	Introducing Additional loss in generic in Tx and Rx, modifying calculations of the wanted, and interference signal strength, and effective path loss to include additional loss in transmission loss, extend SEAMCAT model and LinkResult to enable this feature	Generic Systems	+
Enh	SMG#140	SEAMCAT Application Online help links update to reflect changed link addresses due to moving Manual to the Cloud	General settings, Online help	-
New feature	SMG#136	Import of antenna pattern files (*.msi, *.dat and *.adf format) to SEAMCAT Antenna gain plugins Library, enabling usage of imported files in system settings, antenna gain comparison Tool	AGP, Antenna library	-
Enh	SMG#29	Release check and unit tests – CI/CD enhancements	Backend	-
Enh	SMG#143	Build and run of the source code distributed with release	Backend	-
Bug	SMG#138	InterferenceLinkResult - TxRxInsameBuilding correction	LocalEnvironment	+

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Bug	SMG#142	Propagation model test tool – fix to calculate and show max distance when generating sorted samples in the test	Tools, PMP Tool	-
Bug	SMG#124	TerrainHelper – fixing issue with VLR as reference point coordinate in ISL with Multithreading	Simulation, Terrain	+
Enh	SMG#127	Cellular systems results enhancement – summary results	Results, Event results	-
Enh	SMG#146	Modifications to radiometeorological Data Maps in PMP P.452-16/17	PMP	+
New feature	SMG#147	Implementing terrain functionality to the PMP ITU-R P.1546-6. New functions to compute the input parameters which need to be extracted from the terrain profile. Additional Unit Tests included to validate the implementation.	PMP, Terrain	+
Enh	SMG#37	CommandLine – when extracting results sort vectors in standard predefined order similar in all cellular systems	CommandLine	-
New feature	SMG#134	Introducing Additional loss in cellular systems in Tx and Rx, modifying calculations of the wanted, and interference signal strength, and effective path loss to include additional loss in transmission loss, modify SEAMCAT model to enable this feature	Cellular systems	+
New feature	SMG#135	Multiple propagation model per link implementation for generic systems and generic interference links, modify SEAMCAT model to enable this feature workspace saving / loading with M-PMP	PMP, model, backend, migration	+
New feature	SMG#135	Multiple propagation model per link implementation for cellular systems and cellular interference links, unit tests	PMP, testing	+
Bug	SMG#144	Building Entry Loss in Indoor-to-Indoor links when using BEL model from local environment – calculation of BEL depending on condition if terminals are in the same building, Unit tests	PMP	+
New feature	SMG#144	Same building method new implementation to use different building size from user settings – implementing enhancement for Building Entry Loss calculations in Indoor-to-Indoor links, Unit tests	PMP	+
Enh	SMG#161	TestPropagationModel tool refresh – update calculation settings when adding / changing local environment settings.	Tools	-
Enh	SMG#139	Vector naming in System results - ensuring that the name tags used for vector names are aligned across the code base and presented in similar manner in results.	Results	-
New feature	SMG#112	SEAMCAT Terrain – Terrain data reader for reading SRTM GeoTIFF digital terrain data model, introducing Unit tests for SRTM GeoTIFF reader	PMP, Terrain	+

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New feature	SMG#135	Multiple propagation model per link – implementing solution for last segment when propagation model is not defined (use PMP for last range), refine consistency check message, unit test for last segment	PMP, testing	+
Enh	SMG#144	Adjusting naming of Building entry loss in the indoor local environment for Indoor-to-Indoor links	PMP	-
Enh	SMG#126	Missing description in systems - exception handling	Backend	-
Enh	SMG#162	Model adjustment to enable working of some legacy external EPPs in a new version	Backend / Model	-
Bug	SMG#154	Climate data out of range fix for Southern Hemisphere - when running simulation with terrain or Terrain Profile Tool execution breaks due to climate data index -1	PMP	+
Enh	SMG#151	In Cellular calculations – rename method calculateThermalNoise as it calculates NoiseFloor of the Rx	cellular	-
Enh	SMG#149	Cellular systems - use valueName in iv and v method calls to unify parameters naming in different cellular systems	cellular	-
Enh	SMG#150	Adding Vector result type to Result Class – simplify getting VectorResultTypes and Singlevalue types	backend	-
Bug	SMG#166	CommandLine run - enablement of the SEAMCAT 5.5.0 A4+ application run in the CommandLine mode	CommandLine	-
Bug	SMG#165	User defined MS per BS in IMT-2020 UL and OFDMA-UL as victim – VSL frequency scheduling and interference unwanted (ILT power in VLR BW) and blocking calculation correction (VLR Blocking)	Cellular	+
Enh	SMG#165	User defined MS per BS in IMT-2020 UL and OFDMA-UL as victim – introducing warning messages for VSL frequency scheduling if frequency is outside Tx Bw due to un-consistent user settings	Cellular	-
Bug	SMG#165	User defined MS per BS calculator input enhancement to update frequency scheduler	Cellular	-
Enh	SMG#167	CommandLine results Vector export ordering – summary results vectors export at the fixed position (first columns)	CommandLine	-
Bug	SMG#169	Vector display colouring – avoid duplicating colours in the display od vector results and in EPP results	Results / Presentation	-
Bug	SMG#167	CommandLine run of GeoTIFF terrain workspaces – fixing error messages in prompt when running the CL	CommandLine	-
Enh	SMG#135	Multiple PMP implementation in Tools – integration Multiple PMP in Test propagation models	Tools	+
Enh	SMG#167	CommandLine results Vector export messaging – not exporting run and migration messages in result export	CommandLine	-

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Bug	SMG#156	EPP-10 OFDMA internals – extracting current transmit power, removing distance	EPP, Cellular	-
Enh	SMG#156	EPP-10 OFDMA internals – extracting Inter-system interference, and Total interference power in IMT-2020 UL	EPP, Cellular	-
Enh	SMG#156	EPP-10 OFDMA internals – extracting Inter-system interference, Total interference power, correcting null values for Bitrate achieved and SINR achieved in OFDMA UL	EPP, Cellular	-
Bug	SMG#165	User defined MS per BS in Cellular UL – old workspaces migration, adding consistency message in simulation run, numberOfMsPerBS as specified if user cancels frequency scheduler	Cellular	-
Bug	SMG#176	Debug mode run – avoid creating empty debug file after multiple successive debugs runs	Debug	-
Bug	SMG#153	Presenting achieved SINR instead bitrate in IMT-2020 DL Cellular – Event results	Cellular	-
Bug	SMG#175	Correction of calculation of the simulation radius in the Uniform mode with respect to the Activity factor	Simulation	+
Enh	SMG#164	Calculation and presenting mean (average) of received signal levels – showing Mean (log) and Mean (lin) values in the results	Results	-
Enh	SMG#180	Enhancement of the GUI of the dialog box placement	GUI	-
Bug	SMG#172	Pass on scenario to terrain calculations for CDMA systems	PMP, Terrain	+
Enh	SMG#171	Update bug report tracking URL in Help UI	GUI	-
Enh	SMG#181	Increase accuracy for reported probability in ICE - small interference probability display in interference calculation engine to 1e-7	Results, GUI	-
Bug	SMG#182	GeoTIFF consistency check on missing tiles warning – enable consistency check run ad report even in case of other errors	PMP, Terrain	-
Bug	SMG#183	Add frequency scheduler consistency check to IMT-2020 UL when user defined active MS enabled	Cellular	-
Bug	SMG#188	PMP ITU-R P.1546ver6 - correction of heff1 and heff2 calculations for Tx and Rx and moving it to part of calculation without terrain	PMP	+
Enh	SMG#188	PMP ITU-R P.1546ver6 – adding unit tests for calculation of heff without terrain	PMP	-
Enh	SMG#188	PMP ITU-R P.1546ver6 – adding unit tests calculation of propagation loss with terrain tiles	PMP	-
Enh	SMG#189	Updating consistency check for OFDMA-DL using Beamforming antenna to include subarray and apply only to Interfering systems	Cellular, AGP	-
Enh	SMG#185	Enhancement in loading result files with embedded jar files with PMP lists	Backend	-