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**Agenda item: 7.2.4**

**Source: OPPO (Rapporteur)**

**Title: Summary for 7.2.4 LPHAP excluding SRS configuration & activation part**

**WID/SID: NR\_pos\_enh2 - Release 18**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the summary for agenda item for 7.2.4 (LPHAP) **excluding SRS configuration & activation part**. This document considers the following input papers:

[R2-2307121](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_122/Docs/R2-2305483.zip) Discussion on LPHAP Huawei

R2-2307186 Enhancements for supporting LPHssssAP, Fraunhofer IIS, Fraunhofer HHI

R2-2307394 Discussion on SRS configuration with validity area and alignment between PRS and (e)DRX, CATT

R2-2307428 Discussion on solution of LPHAP, vivo

R2-2307665 Support of LPHAP, Intel Corporation

R2-2307824 Alignment between DRX and PRS, Apple

R2-2308000 Discussion on low power high accuracy positioning, Lenovo

R2-2308051 Discussion on LPHAP enhancement, OPPO

R2-2308126 Discussion on LPHAP, Spreadtrum Communications

R2-2308135 Discussion on LPHAP, ZTE

R2-2308153 Considerations on Low Power High Accuracy Positioning, Sony

R2-2308261 Discussion on LPHA positioning, Xiaomi

R2-2308317 Further considerations on LPHAP, CMCC

R2-2308398 Enhancements for LPHAP, Qualcomm

R2-2308481 Discussion on Low Power High Accuracy Positioning, Ericsson

R2-2308618 Discussion on LPHAP, InterDigital

R2-2308693 Discussion on alignment between (e)DRX and PRS, Samsung

# 2 Discussion

## 2.1 Alignment between (e)DRX and PRS

There are the following proposals in this area:

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| [R2-2307121](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_122/Docs/R2-2305483.zip)  Huawei | Proposal11: Support PRS alignment with fixed DRX and deprioritize DRX alignment with fixed PRS.  Obeservation2: For the PRS alignment with fixed DRX for UE in RRC\_IDLE, the legacy UE-based on-demand PRS procedure can be sent in RRC\_CONNECTED with no stage-3 impacts.  Observation3: For the PRS alignment with fixed DRX for UE in RRC\_INACTIVE, the legacy UE-based on-demand PRS procedure can be sent in RRC\_CONNECTED or RRC\_INACTIVE by SDT with no stage-3 impacts.  Proposal12: For the DL-PRS alignment with fixed (e)DRX, UE-initiated on-demand DL-PRS procedures are used.  Proposal13: LMF-initiated alignment between PRS and (e)DRX is not supported. |
| R2-2307394  CATT | Proposal 8: Support PRS align to fixed DRX. The fixed DRX refer to all the potential PF and PO of the cell, which can be determined by the cell level parameters, e.g. PF\_offset, N and minimum DRX cycle.  Proposal 9: There are some impacts on RAN3 to support PRS align to fixed DRX. Send RAN2 agreement to RAN3 to trigger the discussion. |
| R2-2307428  vivo | Proposal 8: Both UE-initiated and LMF-initiated On-demand PRS can be used to align the PRS configuration with fixed (e)DRX.  Proposal 9: For LMF-initiated On-demand PRS, LMF should obtain UE-related (e)DRX and cell-related (e)DRX in advance, and then it may take the information into account when setting the periodicity and/or response time of deferred MT-LR.  Proposal 10: For UE-initiated On-demand PRS, UE should include UE-related (e)DRX information and LPHAP indication in the On-Demand PRS Request. Upon receiving the indication, LMF should obtain cell-related (e)DRX information from serving gNB and neighboring gNBs.  Proposal 11: On-demand PRS configured by gNBs(serving gNB and neighboring gNBs) includes several PRS configurations aligned with UE’s (e)DRXes in the current serving cell and neighboring cells to avoid frequent on-demand PRS procedures due to cell reselection.  Proposal 12: To align the PRS configuration with fixed (e)DRX, the following solution can be considered:  - LMF should negotiate PRS configuration with selected TRP(s) to ensure there is valid PRS around PO within PTW. (in RAN3 scope)  - UE should perform PRS measurement around PO within PTW. (RAN1/RAN4 related)  Proposal 13: LS to RAN1/RAN3/RAN4 to trigger the discussion on aligning PRS configuration with fixed (e)DRX when RAN2 reaches a consensus on the solution.  Proposal 14: Considering the following aspects, the discussion on aligning (e)DRX with fixed PRS can be de deprioritized in Rel-18.  - It is not feasible to align the (e)DRX of multiple target UEs with fixed PRS considering that different UEs have different PO.  - The (e)DRX cycle can be set depending on the data delay tolerance and power-saving requirements. In this sense, the (e)DRX cannot be adjusted significantly for positioning purposes. |
| R2-2307665  Intel | Proposal 10: Confirm SA2 conclusion that during the positioning procedure, AMF provides the LPHAP indication to the LMF, and the LMF also sends LPHAP indication to RAN in the NRPPa message (stage 2 and RAN3 impact).  Proposal 11: For DRX alignment with fixed PRS configurations, it is up to RAN to align DRX configuration with fixed PRS based on LPHAP indication obtained from the LMF and available PRS configuration in RAN.  Proposal 12: For PRS alignment with fixed (e)DRX configurations, it can be achieved by on-demand PRS request without stage 3 impact. If the UE wants to change PRS configuration to align with (e)DRX configuration, the UE can send on-Demand PRS request to the LMF with suitable recommendation on PRS configuration. |
| R2-2307824  Apple | Proposal 1: to discuss and agree which RRC states (RRC\_CONNECTED, RRC\_INACTIVE, RRC\_IDLE) the solution for DRX and PRS alignment is applicable to; furthermore, to discuss and agree whether the solution is applicable to both DRX and eDRX.  (Rapporteur: the WID RP-231460 presents the following objective: Specify solutions for alignment between (e)DRX in RRC\_INACTIVE and PRS configurations [RAN2], which may address the concern)  Proposal 2: to agree on the general solution direction: PRS alignment to fixed DRX, DRX alignment to fixed PRS, or both.  Proposal 3: if RAN2 is to standardize both solutions (alignment of PRS to fixed DRX and alignment of DRX to fixed PRS), these should be separate features with separate UE capabilities.  Proposal 4: support network-based solution for PRS alignment to fixed DRX (potentially in addition to a UE based solution). |
| R2-2308000  Lenovo | Proposal 8: In the case of LMF performs the alignment, (e)DRX configurations depending on the UE’s RRC state should be shared with the LMF from the gNB or from the UE.  Proposal 9: In the case of gNB performs the alignment, gNB should be indicated to perform the alignment between (e)DRX and PRS configuration explicitly or implicitly. |
| R2-2308051  OPPO | Proposal 1: RAN2 to agree to align the DL-PRS timing pattern with the fixed (e)DRX configuration.  Proposal 2 : Reuse UE-initiated LPP on-demand PRS procedure for PRS to align with fixed (e)DRX. |
| R2-2308126  Spreadtrum | Proposal 1: PRS alignment with fixed DRX is preferred by reusing UE-initiated on demand PRS procedure. |
| R2-2308135  ZTE | Proposal 17: Support to use UE-initiated on-demand PRS procedure for PRS to align with fixed DRX.  Proposal 18: In LPP on-demand PRS request message, support UE to request the PRS time offset associated with each requested PRS periodicity to better align the actual paging location.  Proposal 19: In LPP on-demand PRS request message, support UE to request separate PRS periodicities per PFL in order to align with the paging cycle inside-PTW and outside-PTW, respectively.  Proposal 20: In LPP on-demand PRS request message, support UE to use dl-prs-StartTime-and-Duration to request the PRS reception within the PTW(if existed).  Proposal 21: Support LMF to include UE’s requested PRS periodicities or PRS time offsets in the NRPPa PRS CONFIGURATION REQUEST message. For NRPPa design, LMF requests the PRS transmission characteristics to the serving gNB and neighbor gNBs in the NRPPa PRS CONFIGURATION REQUEST message. |
| R2-2308153  Sony | Proposal 7: In case of aperiodic/event triggered PRS transmission let the LMF align the PRS transmission to the UE DRX cycle/PO,  Proposal 8: In case of periodic PRS transmission let the AMF (or gNB) align the UE DRX/PO to the Periodic PRS transmissions by adding an Offset to the UE-ID for PO calculation, similar to the solution in LTE for MuSIM as specified in 36.304 and 23.502 used for avoiding paging collision. |
| R2-2308261  Xiaomi | Proposal 8: PRS is aligned with eDRX for alignment between eDRX and PRS. if eDRX is changed, the other service except positioning will be impacted. For Alt 1, PRS only relates positioning, the other service of UE will not be impacted.  Proposal 9: Both UE initiated on-demand PRS and LMF initiated on-demand PRS should be considered to support PRS and DRX alignment. |
| R2-2308398  Qualcomm | Proposal 10: For the (e)DRX alignment with configured DL-PRS, support adding the UE configured LCS reporting activity and configured DL-PRS information (e.g., DL-PRS periodicity) to the IE 'Core Network Assistance Information for RRC INACTIVE' (TS 38.413). Inform RAN3 and SA2 on RAN2's decision.  Proposal 11: For the DL-PRS alignment with configured (e)DRX, the LPP Request Assistance Data for on-demand DL-PRS is used. The UE may set the dl-prs-ResourceSetPeriodicityReq according to the configured LCS reporting activity and (e)DRX configuration. FFS whether additional parameter are needed (e.g., DL-PRS slot offset). (UE sends the Request Assistance Data msg to the LMF) |
| R2-2308481  Ericsson | Proposal 9 Cell specific wake up occasion for LPHA users is configured so that PRS can be aligned with the LPHA users wake up occasion. This is achieved by configuring a common UE\_ID for paging for LPHAP users present in the factory.  Proposal 10 Send an LS to RAN4 for gNB to configure suitable Paging time window to complete the PRS measurement in one PTW.  Proposal 11 Send LS to RAN3 to request for NRPPa/OAM signaling support for cell/UE specific DRX/eDRX configurations. |
| R2-2308618  InterDigital | Proposal 3: Standardise the alignment of PRS configuration with fixed DRX only.  Proposal 4: Reuse the legacy UE-initiated on-demand PRS signalling for the alignment of PRS with fixed DRX |
| R2-2308693  Samsung | Proposal 1: RAN2 to support only DL-PRS alignment with configured/fixed (e)DRX in RRC\_INACTIVE.  Proposal 2: RAN2 to reuse the existing UE-initiated on-demand DL-PRS procedure for the DL-PRS alignment with configured/fixed (e)DRX.  Proposal 3: RAN2 to support UE to include requested DL-PRS resource set duration/start offset associated with each requested periodicity in the on-demand DL-PRS request.  Proposal 4: RAN2 to support the UE to include two separate requested DL-PRS information in the on-demand PRS request, considering the case 2 (i.e., two different DRX cycle for inside and outside the PTW) and the case 3 (i.e., two different DRX cycle for CN PTW and RAN PTW.). |

**Rapporteur’s summary:**

Primarily, regarding the method of achieving alignment between DRX and PRS in time domain, companies’ views/preferences are summarized as follows:

* Only Option 1 (alignment of the (e)DRX to the PRS): 0
* Only Option 2 (alignment of the PRS to the (e)DRX): 13 (Huawei, CATT, vivo, Intel, Lenovo, OPPO, Spreadtrum, ZTE, Sony, Xiaomi, Ericsson, Interdigital, Samsung)
* Both Option 1 and 2: 3 (Intel, Sony, Qualcomm)
* No obvious preference is given: 1 (Apple)

According to the contributions, the exampling reasons why Option 1 is against include

* It is not feasible to align the (e)DRX of multiple target UEs with fixed PRS considering that different UEs have different PO (vivo).
* The (e)DRX cycle can be set depending on the data delay tolerance and power-saving requirements. In this sense, the (e)DRX cannot be adjusted significantly for positioning purposes (vivo).
* Spec impact of Option 1 is more than Option 2 (Spreadtrum)
* If eDRX is changed, the other service except positioning will be impacted (Xiaomi)

Considering the given reasons are reasonable, and majority of companies are in support with alignment of the PRS to the (e)DRX, the rapporteur proposes RAN2 to agree that alignment of the PRS to the (e)DRX should be adopted to ensure the alignment between the PRS and the (e)DRX.

**Proposal 1: RAN2 to agree that alignment of PRS to fixed (e)DRX should be adopted to ensure the alignment between PRS and (e)DRX.**

Next, regarding the question letting who (UE or LMF) to initialize the on-demand PRS request procedure to perform the alignment of the PRS with the DRX, the companies’ views are diverge:

* Prefer UE to initialize: 8 (Huawei, Intel, OPPO, Spreadtrum, ZTE, Qualcomm, Interdigital, Samsung)
* Prefer LMF to initialize: 4 (Apple, Lenovo, Sony, Ericsson)
* Support both: 2 (vivo, Xiaomi)
* Others (prefer AMF or gNB to initialize): 2 (Sony, Lenovo)
* No obvious preference is given: 1 (CATT)

The exampling reasons of companies preferring UE-based on-demand PRS request are listed as following:

* The gNB has no idea where the UE is currently camping on in RRC\_INACTIVE/RRC\_IDLE, which means in LMF initiate on-demand PRS procedure, it is hard for gNB to update paging information to the LMF when UE cell reselects. On the contrary, UE can trigger on-demand PRS request if the paging location changed during cell-reselection. (ZTE)
* Since the (e)DRX configuration is already known by the UE itself, it is simple for the UE to initialize the on-demand PRS request procedure (Samsung).

On the other hand, the exampling reasons of companies preferring the LMF-initiated on-demand PRS request are listed as following:

* Obvious benefits (e.g. in terms of air interface signalling and UE power consumption) exist to justify support of the network based solution for PRS alignment to fixed DRX (Apple).
* PRS configuration is known by the LMF, as the LMF provides the PRS configuration to UE in positioning assistance data (Lenovo)

Rapporteur’s understanding is that both methods are reasonable. For UE-initialized method, UE could simply report the demanded PRS configuration according to the current serving cell (e)DRX configuration and UE-specific (e)DRX configuration. After reception of the UE report, the LMF could additionally collect the (e)DRX configuration of neighbour cells if it confirms that the UE belongs to a LPHAP type by receiving the LPHAP indication from the AMF during the positioning session. On the other hand, for LMF-initialized method, after receiving the LPHAP indication from the AMF during the positioning session, the LMF could collect the (e) DRX configuration of the neighbouring cells of the UE, besides the UE-specific (e)DRX configuration, in advance, before sending the PRS configuration as the assistance data towards the UE. In both ways, we could avoid performing the on-demand PRS request procedure frequently upon the UE performs the cell reselection.

**Proposal 2: RAN2 to agree that both of UE-initialized and LMF-initialized on-demand PRS request procedure are adopted for the alignment from the PRS configuration to the (e)DRX configuration.**

Regarding the UE-initialized PRS configuration request, the proposed enhancement to be made for the message are following:

1. to include the demanded PRS time offset associated with each requested PRS periodicity
2. setting the demanded separate PRS periodicities per PFL
3. to include two separate requested DL-PRS information in the on-demand PRS request
4. to include requested DL-PRS transmission activation periodicity/start offset/duration associated with each DL-PRS information
5. to include UE-related (e)DRX information and LPHAP indication
6. setting dl-prs-StartTime-and-Duration to indicate the demanded PRS reception within the PTW
7. setting the dl-prs-ResourceSetPeriodicityReq according to the configured LCS reporting activity and (e)DRX configuration

Obviously, the bullets 1) - 5) have spec impact, while the bullets 6) and 7) seem depending on the UE implementation.

Regarding the bullet 1), company thinks that, if UE requests a PRS periodicity larger than the DRX cycle value, since one PRS period may contain multiple DRX cycles, UE should also request more than one PRS time offset values regarding to the requested PRS periodicity, where each PRS time offset corresponds to a paging location in one DRX/eDRX cycle.

Regarding the bullet 2), company thinks that, if PTW is enabled by UE, the UE should request more than 1 PRS periodicity values in a on-demand PRS request for the alignment of paging cycle inside the PTW and outside the PTW, respectively.

Regarding the bullets 3) and 4), as mentioned by proponent, according to the agreements in eRedCap session until now, two separate PTWs for CN and RAN paging can be configured by the network and the UE performs paging monitoring with different DRX cycle in different PTWs. Thus, there seems the need of having two corresponding sets of the requested DL-PRS information in *NR-On-Demand-DL-PRS-Request* IE. Also, in that case, each requested DL-PRS information can be associated with different sets of activation periodicity/start offset/duration values.

Regarding the bullets 5), regarding the LPHAP indication, as mentioned by proponent, the purpose is for the LMF to coordinate with neighbouring gNBs for the on-demand PRS configuration related to other cells that UE may reselect in future besides the one for the current serving cell. In such a way, the UE does not need to transmit a new on-demand PRS configuration request for every time it performs cell reselection;

**Proposal 3: RAN2 to discuss whether following IEs are needed to be included or enhanced in the UE-initiated on-demand request message:**

* **to include the demanded PRS time offset associated with each requested PRS periodicity**
* **setting the demanded separate PRS periodicities per PFL**
* **to include two separate requested DL-PRS information in the on-demand PRS request**
* **to include requested DL-PRS transmission activation periodicity/start offset/duration associated with each DL-PRS information**
* **to include UE-related (e)DRX information and LPHAP indication**

In addition, some LSs are proposed to be sent to other working groups.

Firstly, one company thinks that since the PRS needs to align to the DRX of neighbour cell, the DRX of neighbour cell should be obtained by the serving gNB via Xn interface or be obtained by the LMF from the gNB and/or AMF. The details should be further discussed in the RAN3. To trigger the discussion in the RAN3, RAN2 agreement should be sent to RAN3. In Rapporteur opinion, we need to discuss firstly whether or not the DRX of neighbour cells should be aligned with the PRS.

Next, one company thinks that it is necessary for the LMF to retrieve the (e)DRX cycle info from the gNB via the NRPPa interface. The rapporteur think that it is useful at least for the LMF-initiated on-demand PRS request procedure, and could be useful also for the UE-initialized cases wherein that LMF collects the (e)DRX cycle info from the neighbour cells after the LMF receives the UE on-demand PRS request message.

**Proposal 4: RAN2 to discuss whether a LS needs to be sent to RAN3 to trigger them for discussion of how to align the PRS with the DRX of serving cell and/or neighbour cell.**

It is also proposed by a company that a LS should be sent to RAN4 for gNB to configure suitable Paging time window for the UEs to complete the PRS measurement in one PTW. The intention is to let LPHAP UEs wake up at the same time. However, the company also proposes that another feasible solution configuring a common UE\_ID for paging for LPHAP users present in the factory. So Rapporteur thinks whether or not this LS should be sent out should depend on the discussion result of whether it is needed to and if the answer is yes, FFS how.

**Proposal 5: RAN2 to discuss whether it is needed to align the LPHAP UEs waking up time and if the answer is yes, FFS how.**

## 2.2 Extending eDRX cycle beyond 10.24s in RRC\_INACTIVE

There are the following proposals in this area:

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| R2-2307428  vivo | Proposal 15: RAN2 to consider aligning SRS configuration with fixed eDRX (especially for the eDRX cycle beyond 10.24s). The solution can be:  - LMF acquires the eDRX configuration and takes it into account when setting the periodicity of the requested SRS.  - LMF indicates the serving gNB to configure the SRS close to the paging occasion.  Proposal 16: LS to RAN1/RAN3 to trigger further discussion on aligning SRS configuration with fixed eDRX when RAN2 reaches a consensus on the requirements and initial solutions. |
| R2-2308135  ZTE | Proposal 16: Support to extend the PRS periodicity larger than 10240ms to suit the eDRX cycle value for eDRX paging cycle in RRC\_INACTIVE and/or RRC\_IDLE. |

**Rapporteur’s summary:**

Regarding proposals on the alignment between SRS and eDRX in R2-2307428, since the alignment of SRS configuration with the fixed eDRX is outside the scope of objective given in WID RP-231460, Rapporteur thinks it is better to postpone to the future release.

Regarding the above proposal in R2-2308135, as one of the objective of the WID is to specify solutions for alignment between (e)DRX in RRC\_INACTIVE and PRS configurations, and bearing in mind that RAN2#121 RedCap AI has made the following agreements regarding the Long eDRX cycle: Long eDRX cycle (>10.24 s) value range of enhanced INACTIVE eDRX is same as IDLE eDRX from 20.48s to 10485.76s, i.e., hf2, hf4, hf8, hf16, hf32, hf64, hf128, hf256, hf512, hf1024, it is reasonable to extend the PRS periodicity larger than 10240ms. Meanwhile, Rapporteur thinks that such proposal should be confirmed with RAN1 in terms of the feasibility.

**Proposal 6: RAN2 to agree that the PRS periodicity is extended to be larger than 10240ms to suit the eDRX cycle value for eDRX paging cycle in RRC\_INACTIVE and/or RRC\_IDLE. LS to RAN1 for confirmation of the feasibility.**

## 2.3 Measurement in RRC\_IDLE and report in RRC\_CONNECTED

There are the following proposals in this area

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| R2-2308135  ZTE | Proposal 22: Support UE to utilize the positioning assistance data through posSIB or pre-configured assistance data in RRC\_CONNECTED when UE is to perform positioning in RRC\_IDLE. |
| R2-2308618  InterDigital | Proposal 5: Study when the UE can transition to RRC\_CONNECTED to send the measurement report that contains measurements made during RRC\_IDLE |

**Rapporteur summary:**

As mentioned in R2-2308135, since the UE in the RRC\_IDLE state cannot perform SDT, when the UE performs the positioning in RRC\_IDLE state, the UE can only utilize the positioning assistance data through posSIB or pre-configured AD when UE in RRC\_CONNECTED rather than the DL SDT message. Rapporteur thinks this proposal looks reasonable and as previously for the RRC\_Inactive positioning, RAN2 needs to confirm how the positioning assistance data can be delivered to UE.

**Proposal 7: RAN2 to agree to support UE to utilize the positioning assistance data through posSIB or pre-configured assistance data in RRC\_CONNECTED when UE is to perform positioning in RRC\_IDLE.**

As mentioned in R2-2308618, triggered event for the positioning in the RRC\_IDLE state has not been discussed before. For the positioning in RRC\_Inactive state, triggered event could be a periodic event, a arear event or a motion event. In Rapporteur’s opinion, triggered event for the positioning in the RRC\_IDLE state could be defined in a way similar with the RRC\_Idle positioning. However, the legacy operation is AS context is not stored when the UE enters the RRC\_IDLE state. If such tradition is followed, triggered event may not be able to be defined for the positioning in the RRC\_Idle state.

**Proposal 8: RAN2 to discuss whether or not triggered event(s) should be defined for the positioning in the RRC\_IDLE state for the UE to transit to RRC\_Connected state for the measurement reporting. FFS what kind of triggered event should be introduced.**

## 2.4 Relaxed PRS measurement for LPHAP

There are the following proposals in this area

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| R2-2308135  ZTE | Proposal 23: Support relaxed PRS measurement for LPHAP by reducing the PRS reception chance according to some criteria, e.g., UE not at cell edge criteria or low mobility criteria for relaxed RRM measurement can be reused. |

**Rapporteur:**

As the relaxed PRS measurement is not in the R18 positioning WID scope, this proposal is suggested to be not pursed in this Release.

## 2.5 Enhancement of UE entering sleeping mechanism

There are the following proposals in this area

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| R2-2307186  Fraunhofer | Proposal 1: RAN2 to agree that the UE shall only enter the sleep phase after the UE has received some form of feedback from the network that the NW has obtained the UE position with the required accuracy.  Proposal 2: A feedback, where a positive confirmation of completion of positioning procedure shall be transmitted to the UE from the LMF (via gNB), signalling the UE to go into sleep phase of the DRX cycle.  FFS: How the feedback is incorporated? LPP? MAC-CE?  FFS: Should there be a threshold value of DRX cycle beyond which the UE needs to wait for feedback from network before going to sleep? |

**Rapporteur:**

This contribution suggests to introduce a mechanism that UE does not really enter sleep mode, before receiving a confirmation indication from the LMF or the serving gNB, in order to make sure that all TRPs and optionally the UE have already completed the SRS/PRS measurement before entering the sleep mode. In Rapporteur opinion, this issue seems outside the scope of the current WI objective and hence suggest not to be pursued in this release.

# 3 Conclusion

The following proposals are to be agreed (potentially long-time discussion is needed for proposal 2):

**Proposal 1: RAN2 to agree that alignment of PRS to fixed (e)DRX should be adopted to ensure the alignment between PRS and (e)DRX.**

**Proposal 2: RAN2 to agree that both of UE-initialized and LMF-initialized on-demand PRS request procedure are adopted for the alignment from the PRS configuration to the (e)DRX configuration.**

**Proposal 6: RAN2 to agree that the PRS periodicity is extended to be larger than 10240ms to suit the eDRX cycle value for eDRX paging cycle in RRC\_INACTIVE and/or RRC\_IDLE. LS to RAN1 for confirmation of the feasibility.**

**Proposal 7: RAN2 to agree to support UE to utilize the positioning assistance data through posSIB or pre-configured assistance data in RRC\_CONNECTED when UE is to perform positioning in RRC\_IDLE.**

The following proposal is to be discussed:

**Proposal 3: RAN2 to discuss whether following IEs are needed to be included or enhanced in the UE-initiated on-demand request message:**

* **to include the demanded PRS time offset associated with each requested PRS periodicity**
* **setting the demanded separate PRS periodicities per PFL**
* **to include two separate requested DL-PRS information in the on-demand PRS request**
* **to include requested DL-PRS transmission activation periodicity/start offset/duration associated with each DL-PRS information**
* **to include UE-related (e)DRX information and LPHAP indication**

**Proposal 4: RAN2 to discuss whether a LS needs to be sent to RAN3 to trigger them for discussion of how to align the PRS with the DRX of serving cell and/or neighbour cell.**

**Proposal 5: RAN2 to discuss whether it is needed to align the LPHAP UEs waking up time and if the answer is yes, FFS how.**

**Proposal 8: RAN2 to discuss whether or not triggered event(s) should be defined for the positioning in the RRC\_IDLE state for the UE to transit to RRC\_Connected state for the measurement reporting. FFS what kind of triggered event should be introduced.**