Two additional questions about prototyping:
- Is there a physical prototype already available (how you read it out, etc. Or when is it planned)
A physical prototype of the sPHENIX outer HCAL does exist and was used in the sPHENIX test beam. Depending on the tiles installed in it could be configured for different eta regions. We don't currently have plans for a test beam, although it might make sense to do one a bit later when the ePIC SiPM's and HGCROCs are available, so we can basically do a full chain test.

- Do you already have a waveform from the SiPM output available (picture or data)
Not from the new SiPM's we plan to use, but I suspect something is available using the sPHENIX SiPM's. I can check and have a look (requested from sPHENIX)

SiPM information/requirements (not exactly ASIC-related, but good information to have):
- manufacturer
- size [mm] (individual chip)
- bias range (min & max that need to be set) [V]
- operating overvoltage (planned) [V]
- stability required [mV]
- bias voltage accuracy (IF NEEDED, for using pre-calibration voltages) [%]
- bias voltage current (max, after lifetime irradiation) [uA]
- bias voltage temperature compensation (or will SiPM temperature be controlled instead)?
- array of SiPM/channel [how many; series/parallel scheme]
- capacitance/channel
- #pixel/channel
- dynamic range required/channel [pC]
(minimum signal important to detect is discussed below (Hit requirements))
Already documented (to the degree we know it) in the SiPM spreadsheet:
https://brookhavenlab.sharepoint.com/:x:/r/sites/EICPublicSharingDocs/_layouts/15/Doc.aspx?sourcedoc=%7BBC780204-F5C5-4792-AA87-8AB12B29DBD7%7D&file=SiPM.Specs.xlsx&action=default&mobileredirect=true

Our preferred SiPM at this point is the Hamamatsu S14160-3015PS
A comment on dynamic range – the 40k pixel format chosen by sPHENIX (to have one a lot of range, and for a single tile we don't expect to fire more than 10k pixels. Seeing single MIPs is important, so we need to see something like a few pixels. Not sure how to convert this to pC for the sensitivity. Keep in mind that we will have multiple (~7) samples per MIP, so we can combine them much like you do in a TPC to get better accuracy on dE/dx, so even if we are at the edge we will get some benefit of averaging.

FEB signal processing requirements:
(Preamp information)
- linearity requirement [max nonlinearity % over full range, or a more detailed spec]
- gain stability (w.r.t. time/drift, internal noises of the FEB, FEB temperature, external interferences) [%]
- peak time (or max peak time to avoid pile-up) [ns]
- charge resolution [% of full scale or a more detailed spec, e.g. % of signal at various signal sizes]
- Time-of-hit resolution [ns]
- double-pulse resolving time [ns] (i.e. readout of two pulses separated by less than this **may have pileup errors or may be seen as one pulse**)

The requirements for the HCAL are somewhat lax. With an expected 10-15% constant term we think set by the tile variation a few % linearity should be OK. Of course, by calibrating individual tiles we may get the constant term better than 10-15%. Gain stability at the level of a few % (after temp correction) is very desirable. We don't plan to use much for time resolution with the outer HCAL.
The expected signal is of order 100ns long (depending in amplifier), so that may set the double-pulse resolving time.

Hit processing / streaming readout requirements:
- Hit threshold [pC] (OR a more detailed spec over detector geometry if appropriate)
- Hits defined by something more than each channel independently? ("no")
- Hit rate (physics+background) per channel maximum [kHz] (OR a more detailed spec over detector geometry if appropriate)
- Does the hit rate requirement apply independently to all channels or has to be understood with some correlation in mind?
Needs some simulations to quantify (physics + background) hit rate. Nearby channels will be correlated (jets).

Slow control:
- SiPM bias current monitoring [Yes]
- temperature monitoring [Yes]

Accessibility of the FEB and RDO:
- FEB on detector [Yes]
- FEB accessibility [between runs] (Radiation tolerance)
- FEB-RDO minimum distance [<3m]
- RDO on detector [Yes]
- RDO accessibility/location (Radiation tolerance) outer edge or middle of sectors