2011年 東北地方太平洋沖地震
2011 Off-the-Pacific-Coast-of-Tohoku Earthquake

**Preliminary view from the first 1.5 weeks,
with emphasis on how we felt it at KEK,**

by

Nobu Toge (KEK, Accelreator Lab.)

Linear Collider Workshop of Americas - ALCGC 11
http://ilcagenda.linearcollider.org/conferenceTimeTable.py?confId=4572#20110323.detailed

How was it when it happened?

https://picasaweb.google.com/acc.cont/LinacMar2011?authkey=Gv1sRgCMfDgePDrcfWeA&feat=directlink#5584541480234556002

A movie recorded by K.Suzuki (KEK, Linac Group) who happened to be inside the accelerator tunnel of the injector linac on Tsukuba campus of KEK (via K.Furukawa, KEK)

2011/3/11 ATF at KEK

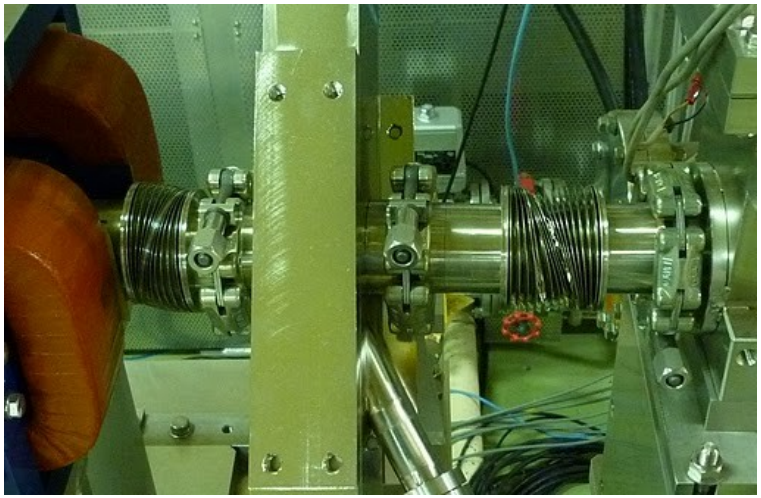
2011/3/11 14:47 JST
Magnitude 8.8 (later updated as 9.0); Seismic scale in Tsukuba: ~6.
Shaking continued for ~ 5min.

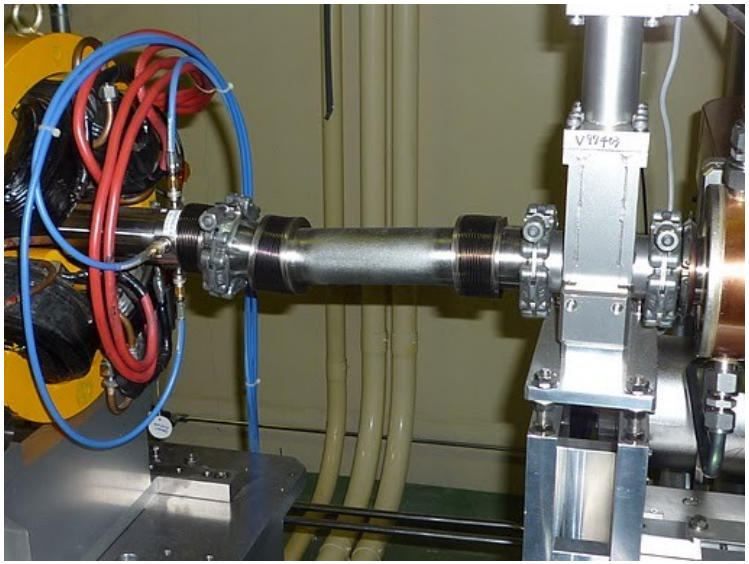
Pics above are by N.Terunuma, S.Araki, who stepped into the Assembly Hall Bldg, soon after the first hit. Not long after taking these pics, the staff was told to leave this hall until its safety is established.

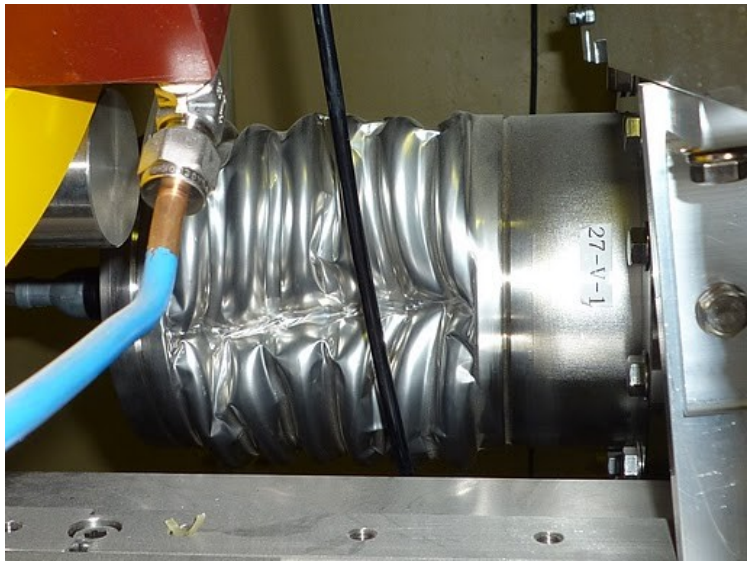
2011/3/11 KEK Injector

https://picasaweb.google.com/acc.cont/LinacMar2011?authkey=Gv1sRgCMfDgePDrcfWeA&feat=directlink#

K.Suzuki, K.Furukawa (KEK)







2011/3/11 J-PARC

Pics via T. Kozeki, KEK

Road_Linac

MR_C2Entrance

NU_MonitorBuildingEntrance

NU_targetStationBuilding

2011/3/11 J-PARC

Pics by H. Kagi, Geo-Chem Research Center, U.Tokyo

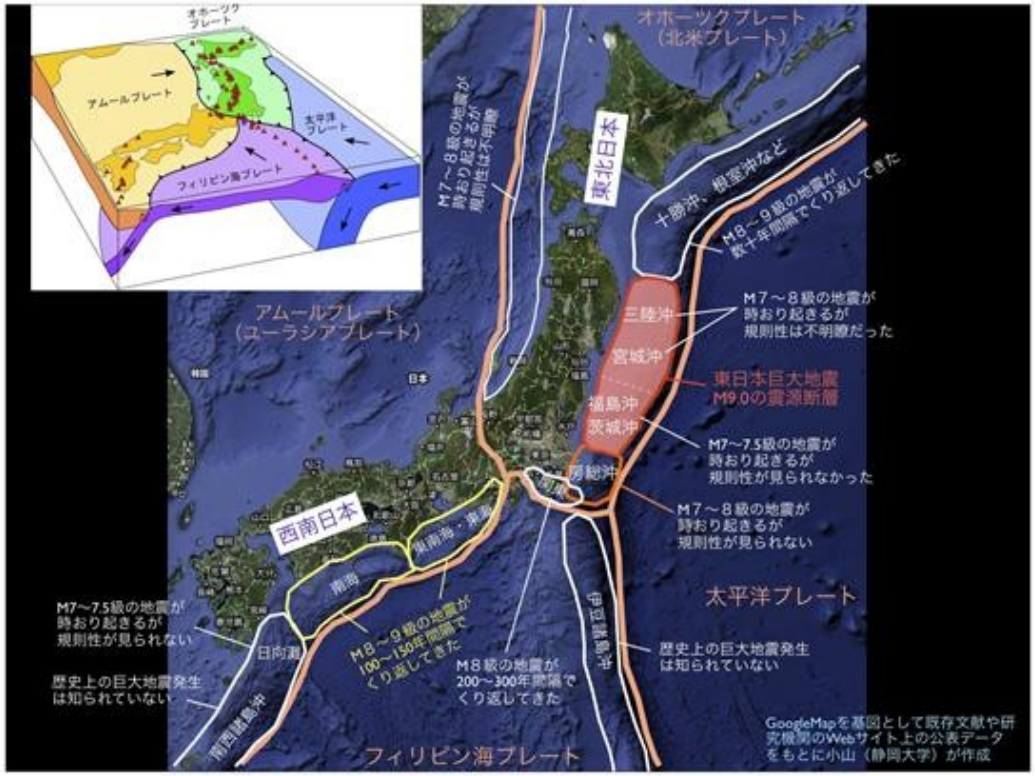
Akogi-gaura Hostel Facility

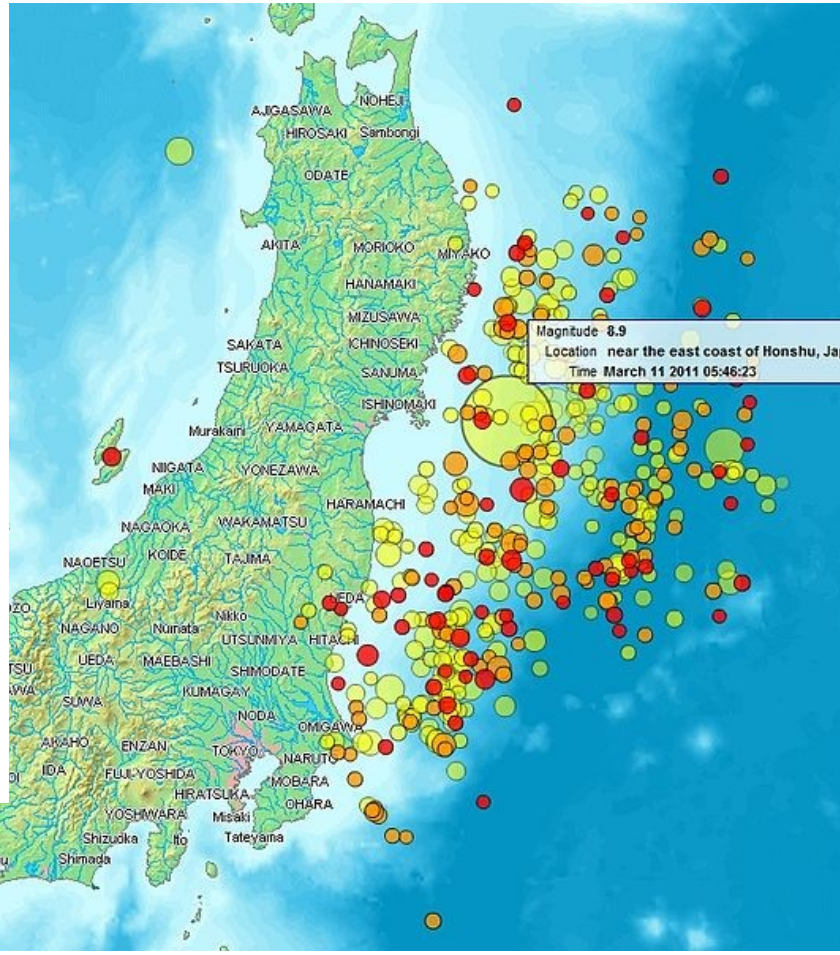
From MLF toward the Main Gate of JAEA

2011/3/11 Toge's House in Tsukuba

- Tsukuba area faced immediate power outage, but no fire, no houses falling down.
- Cell phones became un-reachable. Communication maintained via text mails over cell-phones. E-power came back on ~ 3AM next day 2011/3/12.

Due to the black-out, many of us could not watch TV for a while, only being able to listen to the radio. We could not grasp the "big picture" on the basis of "what we see" till the next day March 12, when the power came back on.





http://plixi.com/p/85195102#
By Masato Koyama

Wikipedia

2011/3/12-14 KEK

- Many of us came to KEK the next day Saturday 3/12, to tidy up the office.
- DG Suzuki's address on Monday 3/14 at 10AM told us that KEK'd be in limited operation till Thursday 3/17, which was extended later.

- Warning instructions were given not to enter buildings with known damage.
- We are told to report any notable damage, etc, so as to set up add'l no-step-in zones.

KEK Status and Response in General

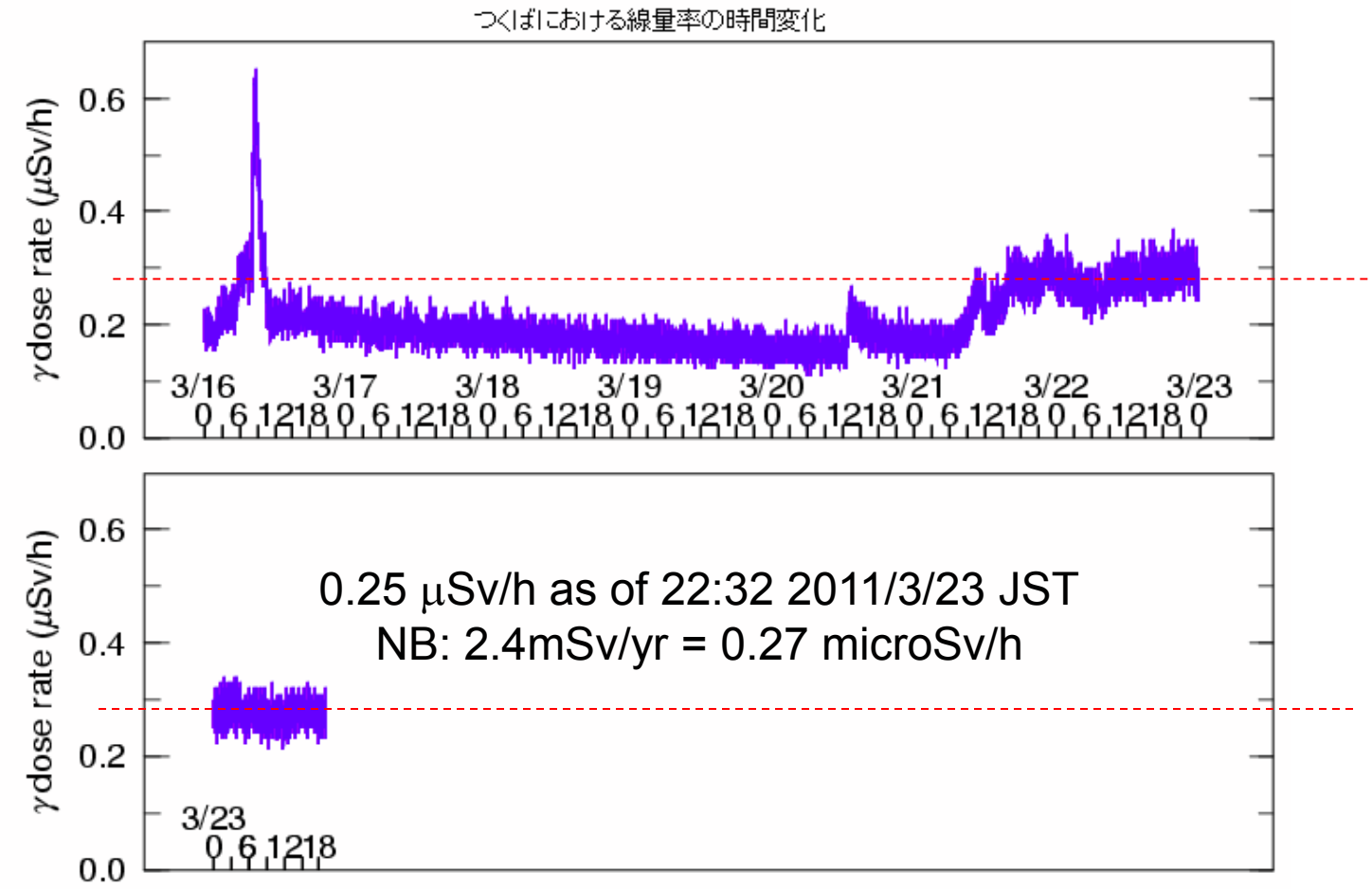
- No personal injuries were observed at KEK Tsukuba / Tokai campuses.
- No leaks of hazardous materials were spotted.

- Subsequent KEK operation became under tightly limited E-power (< 2MW) . Most staff stayed home.
- First priority is to secure ones' own safety, save energy, save gas. PF symposium was cancelled. Ground-breaking ceremony of Super-KEKB is postponed. Recovery of the power to start gradually on 2011/3/22.

- Another priority, of course, is to assess the damage.
  - Numerous cases of damage are observed on building walls (plus roads in case of Tokai campus for J-PARC), but no research buildings actually crumbled down.
  - Substantial damage on equipment. Their exact extent is currently under systematic survey.

- KEK to help, also, the community and respond to public request / concerns. http://www.kek.jp/quake/en/index.html
  - KEK on stand-by to support radiation screening upon refugee's arrival.
  - KEK joined the group of nat'l labs to monitor radiation: http://www.kek.jp/quake/radmonitor/index-e.html

http://rcwww.kek.jp/norm/



Real-time monitor data (KEK Rad.Safety G) publicly viewable at KEK Tsukuba site, accessible via http://www.kek.jp

Voluntary Activities by Scientists in Basic / Applied Sciences

- Substantial public concerns started mounting over the series of failures at TEPCO's Fukushima Nuclear Power Stations → Potential risks of public panic.

- Self-formed "clusters" on Twitter, and elsewhere, of scientists, including, but not limited to, high-energy physicists started trying to transmit reliable information on the basics of radiation safety, in a plain language.

- Exchanges on Twitter
  - Counseling and Q&As on radiation safety.
  - Pedestrian's guide on how to understand radioactivity at Fukushima, where nuclear power stations are located.
  - Continually updated plots of environmental radiation levels on the basis of monitor data as published by various sources (TEPCO, local gov'ts, labs)

Examples

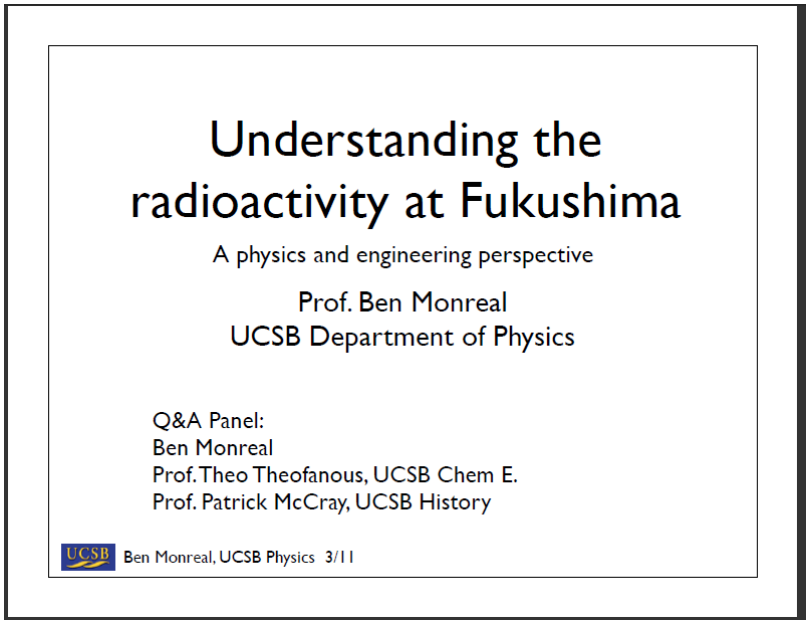
- K. Nakagawa (Tokyo U. Hospital - Radiology) started a new twitter account for transmitting information on health impacts of radioactivity, i.e. what to worry, what not to worry, etc in a plain language.
  - http://twitter.com/team_nakagawa
  - http://www.u-tokyo-rad.jp/

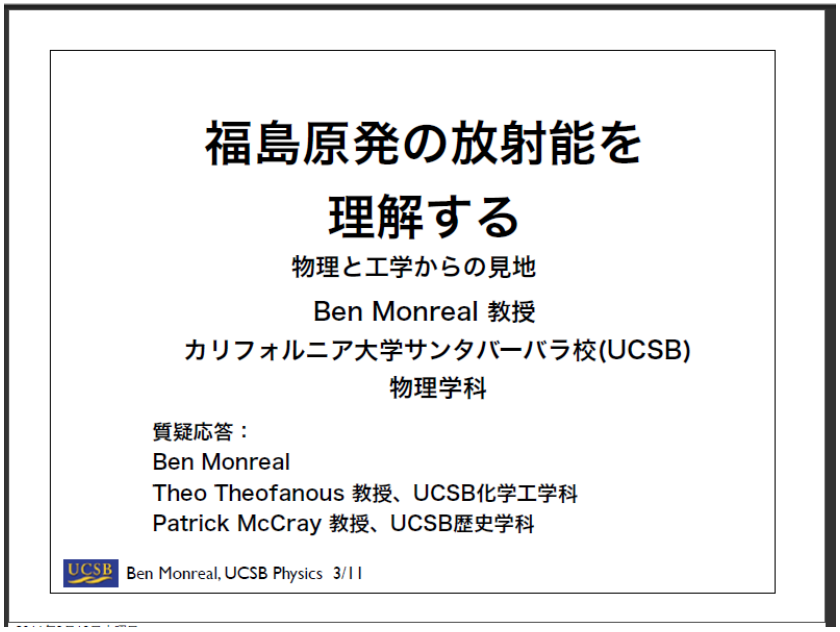
- R.Hayano (Dep't of Physics, U of Tokyo – Nuclear Physics Exp) started counseling on Twitter on radioactivity; the log was later consolidated into a Q&A set and was compiled at the web site of SMC (Science Media Center) Japan.
  - http://smc-japan.sakura.ne.jp/?p=982
  - SMC-Japan site collects many other useful contributions from scientists across Japan, describing nuclear reactors, earthquakes, scheduled power outage (blackout) etc.

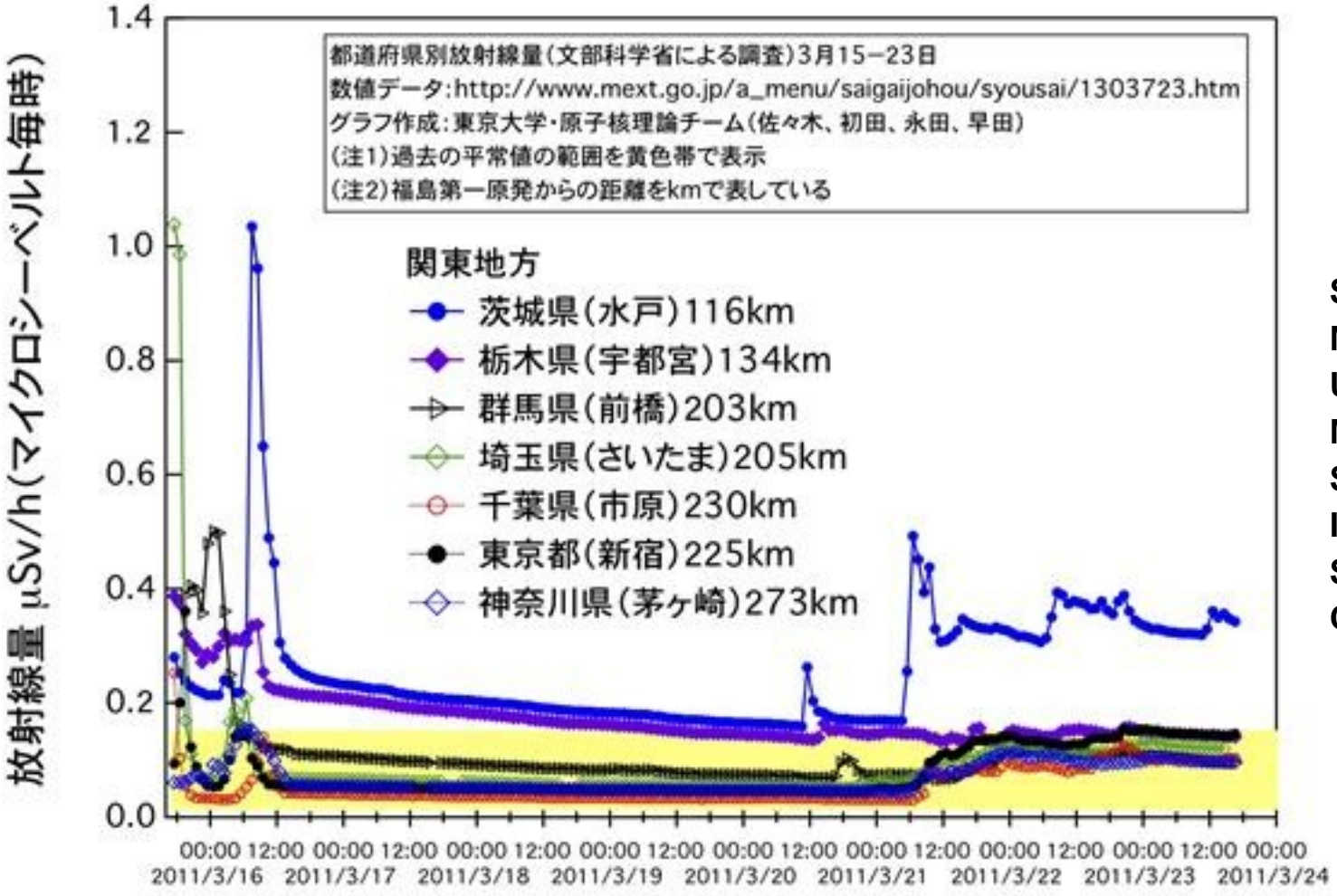
- They, and several others, turned out to be major help for peace of mind of the public (at least on twitter). Government sites are catching up, too.

Slides posted for understanding Fukushima nuclear PP issue

- http://online.kitp.ucsb.edu/online/plecture/bmonreal11/ ← original
- http://ribf.riken.jp/~koji/jishin/ ← J translation by volunteers M.Nojiri (KEK) et al.

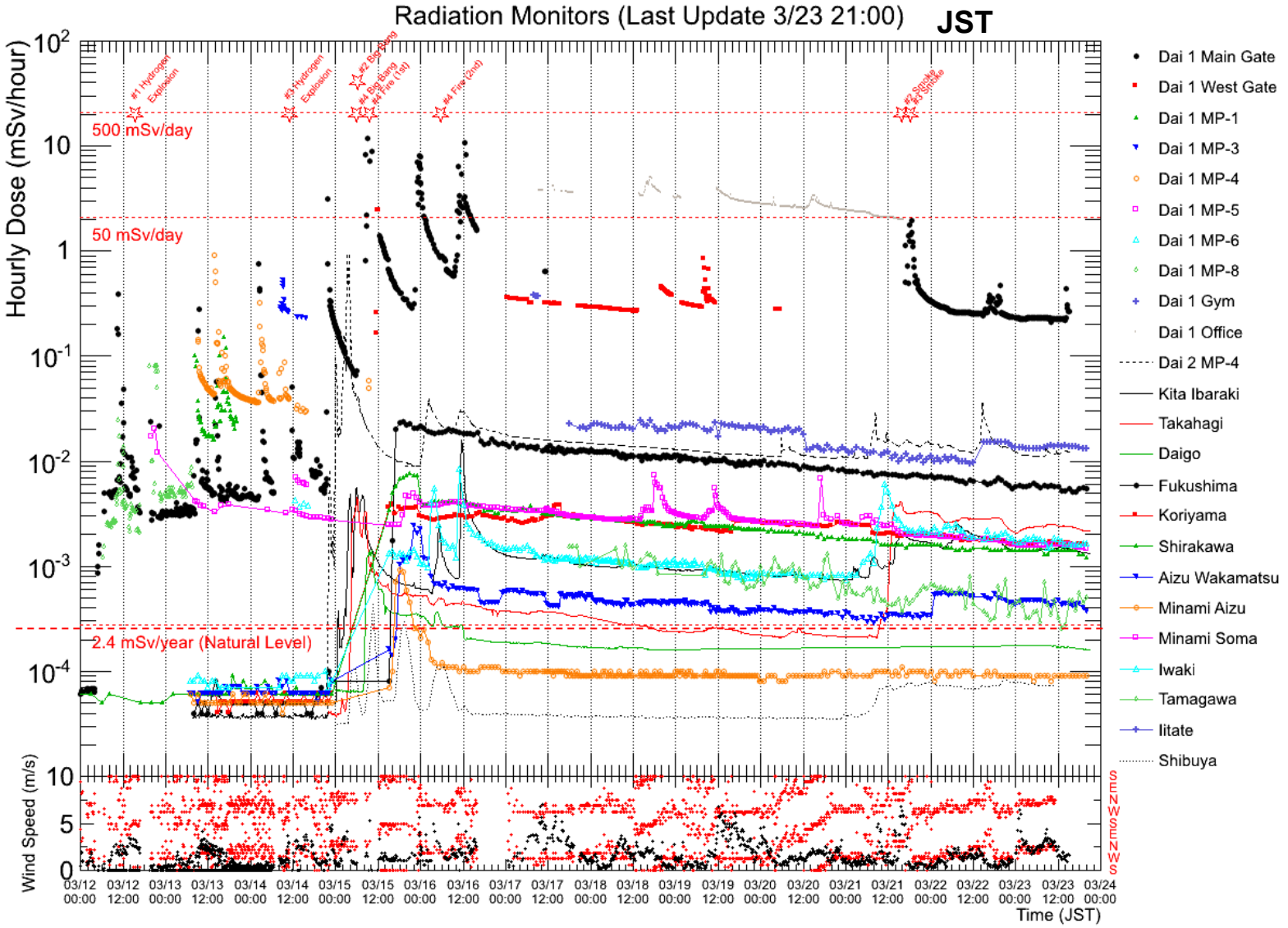






Sendai / Miyagi
Mito / Ibaraki
Utsunomiya / Tochigi
Maebasi / Gunma
Saitama / Saitama
Ichihara / Chiba
Shinjuku / Tokyo
Chigasaki / Kanagawa

http://plixi.com/p/86230223 : Plot by the Nuclear Physics Theory group of U.Tokyo, using the environmental data which are posted at the MeXT site. Emphasis is on radiation levels in neighboring prefectures around Fukushima. We see that the situation seems to be on its way of converging to the normal. Possible wind effects are seen (to be confirmed).



http://dl.dropbox.com/u/16653989/NuclPlants/index.html by A. Okumura (ISAS/JAXA) et al, combining the radiation mon data which are otherwise scattered across the cyberspace. More twitter'ers at similar efforts: K.Takeuchi (Waseda U), R.Ichimiya (KEK, IPNS) who maintains https://sites.google.com/site/radmonitor311/home and many more.

… and in English

- For those of you who'd like to read English updates on Fukushima "Dai-ichi" (#1) Nuclear Power Station, the following sites might help
  - http://www.jaif.or.jp/english/ (← I learned this from Barry Barish. Thnx!. JAIF = Japan Atomic Industrial Forum)
  - http://www.iaea.org/newscenter/news/tsunamiupdate01.html (IAEA Fukushima Nuclear Accident Log)

- English version of the Q&A on Nuclear Power Stations for the public in Japan. Compilation by The Science Media Center in Japan, in collaboration with R.Hayano of Physics Dep't, U.Tokyo:
  - http://smc-japan.sakura.ne.jp/?p=982

Summary (1)

- Members of the HEP and Nuclear Physics Communities in Japan survived the 2011 Earthquake.
- Material damage at KEK, which is substantial, are being systematically assessed.
- Partial recovery of E-power at KEK began on 3/22 JST. Recovery strategies are to be formed for the full research capabilities of KEK . ETA should become known, hopefully soon.
- However, the North-Eastern Honshu areas were struck by far more serious devastation (9199 dead, ~ 13,000 missing as of 0:30AM 3/23, NHK). Impacts of the failures of Fukushima Nuclear Power Station are yet to be fully understood, counter-actions are still not fully developed, and the situation is evolving although perhaps into convergence.

Summary (2)

- We at KEK will be acting in accordance with the national priority. We are offering our specialty-based assistance to the public. E.g., in response to government requests: Radiation monitoring equipment; screening of personnel.

- Also seen are voluntary activities of scientists in basic / applied research, with participation by some members of KEK. Attempts are being made to consolidate the scattered data for systematic analysis, as well as to raise the proper public understanding of radiation safety and its implications.

- I firmly believe that that Japan (and KEK) will eventually come out of this crisis and be back. When that happens, numerous improvements will have to be newly incorporated into our social system, on the basis of many lessons from the cascade of incidents we are experiencing. We shall see how it goes.

- **And our big thanks to the colleagues outside Japan who are giving us warm words. They are highly appreciated. We would like you to know that.**