



***** RaDyO Planning Meeting: 6-8 June 2007 *****
Scripps Institution of Oceanography
La Jolla, CA
T29 “Cottage Above the Cliffs”

Dear RaDyO Participant;

Thank you for agreeing to meet at Scripps Institution of Oceanography on 6-8 June 2007. This meeting will require the full 2 ½ days so be sure to plan your travel accordingly. The main focus of this planning meeting is to **finalize plans for the Scripps Pier Test Experiment** and **plan the “Benign Conditions” field experiment**. This will be essential for ship requests.

Walter Munk has agreed to talk with us during the RaDyO meeting. Walter has gone back to the Cox & Munk work of the 1950s and is having a new look at it in the light of recent work. We will have an icebreaker reception following his talk on Wednesday, 6 June.

We will start the meeting with an overview of the Scripps Pier Test Experiment plan (a summary of the Montreal meeting is on the RaDyO website – URL below). We will reorient ourselves with the Scripps Pier, paying special attention to shadowing effects, crane usage, small boat usage, instrument co-location, etc. Please ensure that someone from your group has the exact specifications of your Pier Test instrumentation on-hand. Our primary goal of this meeting is to ensure that the Scripps Pier Test Experiment is finalized, i.e. when RaDyO participants show up in San Diego in January 2008, the experiment can commence immediately.

The other goal of this meeting is to nail down plans for the “Benign Conditions” field experiment. After brief presentations regarding the Santa Barbara Channel climatologies (winds and waves, currents, and optics), we will discuss as a group the ideal location and timing for the experiment. Once consensus is reached, we may break out into small groups to further discuss the data collection plans for the experiment. Keep in mind that we have only 8-9 months of time between the Pier Test and first field experiment so time spent planning for the Benign Conditions experiment is limited. *Any major issues must be resolved by the end of this meeting.* Time permitting, we will start rough planning for the “High Sea State Conditions” field experiment.

The afternoon of Friday, 8 June is reserved for individual PI small group meetings and other side discussions.

If you have any questions regarding the meeting agenda and discussion topics, please contact us at tommy.dickey@opl.ucsb.edu, grace.spada@opl.ucsb.edu, and cc to ackless@onr.navy.mil. For meeting logistical issues, contact Heather Fryling (heather@mpl.ucsd.edu) or Ken Melville (kmelville@ucsd.edu). Also see the RaDyO website for more information: <http://www.opl.ucsb.edu/radyo/> (for Montreal meeting summary, click on Meetings and the Reports checkmark).

Thank you,
Sincerely,

Tommy Dickey and Grace Chang

***** RaDyO Planning Meeting: 6-8 June 2007 *****
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Wednesday, 6 June

08:30 Breakfast (on your own or provided is TBD)

09:00 Review of RaDyO accomplishments and overview of RaDyO goals for the next 2 years' experiments.

Linwood review of Hi-Res – characteristics of wave field using radar – can you get pictures of the sea surface instantaneously? Highest waves not yet obtained. Predict changes in wave field for naval operations – rogue wave avoidance or dynamic positioning purposes. What are the physics involved with wave field? How important is breaking? Don't quite understand air-sea interaction – effects of winds on waves or vice versa. Fieldwork at SIO pier, off SD (FLIP, ships, moorings, drifters, aircraft overflights, remote sensing, modeling). WAMOS on FLIP for RaDyO experiment (5-m spatial resolution). Possible field locations – off Pt. Conception or offshore of San Clemente Island. Spring for high winds and waves.

09:15 Overview of RaDyO Scripps Pier Test Experiment goals and plans made during Montreal Meeting.

09:35 Howard and Andres polarimetric imaging presentation.

Passive optical remote sensing for studying dynamics of upper ocean. Want to solve for ocean surface. Have one camera pointed up (sky camera – still need Ken V.'s because it won't be as accurate) and one down for incident Stokes vectors and ones reflecting off the ocean. Resolution O(mm), image of 1x1 m. Want 50-60Hz temporal resolution.

09:45 Expected conditions (meteorological and oceanographic) at Scripps Pier in January 2008. (Ken M.)
Discuss logistics involved in Pier Test.
Housing requirements, lab/computer space availability, machine shops, small boats, meeting/conference room availability, etc.

Ken M.'s breaking wave studies. Luc's experiment in wave tank.

SIO Pier: 2nd boom is done. New machine shop is done.

Wind and wave climatology in Central & So. Cal. Weather prediction is pretty good for winter. Swell component from Gulf of Alaska can be significant. Any reflection from pier? Is it a concern? Ken says probably not. Pier pilings are relatively small. May be a problem for finer scale studies.

(Coffee Break)

1/6 set up

1/13-26 data collection

1/27 wind down

Field Participants:

Mike B., Chris, Howard, Russel, Johannes, Andres

David, Svein + 1

Mike T. and Scott

Tommy, Frank, Grace, Derek

Ken V., Luke and Peru

Marlon, Ronnie, Jianwei

Dariusz, Mireck + 2

Ken M., Luc, + 1

Accommodations:

Marriott Residence Inn
Local Holiday apartments
VRBO.com
Hotels
Ken will do homework.

Booms:

Mike B. group on boom
Ken M. on boom
Tommy and Grace bring our own winch system for profiling with optics package
Mike T., Marlon, & David bring their own winch system for MASCOT cage
Ken V. use ROV
Dariusz on boom

Other Notes:

Luc working on network timing source for synchronization purposes (NTPD).
Make sure each group is independent as far as tools and supplies are concerned.
Lab space requirements for end of pier? Rack space? Bench space? Data processing space?
Meeting space for daily briefings?

- 11:00 Group discussion on what needs to be resolved.
What are the modelers' needs?
- 12:00 Lunch (on your own or provided is TBD).
- 13:00 Walk to Scripps Pier for reorientation.
Group discussion on exact location/co-location of instruments. Assume two booms and a crane for profiling (and AUV deployment and retrieval) will be available. Pay special attention to potential interferences. Take a walk around Scripps campus if necessary.

Space issues:

Mike B. et al.: 8-12 ft bench space, tall rack, office space for 2-3 people
David F. et al. (w/ Mike T. and OPL): 3 ft bench space, office space for 4-6 people
Ken V. et al.: 4 ft bench space, camera on roof of permanent building, office space for 1 person
Marlon et al.: 4 ft bench space, camera on roof of permanent building, office space for 2 people
Dariusz et al.: 4 ft bench space
Ken M. et al.: full rack
Trailer is 17' x 8' – can accommodate.

NW Boom: Mike B. et al. Ken V. et al. and Dariusz et al.

SW Boom: Ken M. et al. and Dariusz

S side: OPL

Along the S side: David F., Marlon et al., and Mike T. et al.

Roof of permanent building: Marlon et al. and Ken V. et al.

Ken V: ROV off N side

Week of January 6th set up

January 13-26th experiments

Morning briefings – 20 min – in off-pier trailer

Weekly meetings – 1 hr – in library meeting room (?)

After-experiment meeting – 1 day (January 28, 2008) – discuss data sharing, what went well, informal presentations

March 2-7, 2008 Ocean Sciences
September 2008 Santa Barbara Channel Field Experiment
September/October 2008 Ocean Optics
Spring 2009 High winds/wave conditions field experiment

Need relative locations for each measurement.

Each morning briefing, one group “leader” will provide listing/description of data collected on previous day. A log will be compiled for the entire 2-week experiment.

- 15:00 Coffee Break
- 15:15 Review what was discussed at the pier and put in writing.
Ensure all RaDyO participants are satisfied with the design plan.
- 15:30 Group discussion on time schedule for Pier Test.
Discuss experiment set-up period, time in water, time for winding down. Daily start time for data collection – what will be autonomous (continuously running) – if anything, what will not. Discuss daily PI meetings – what needs to be discussed each day to ensure we are meeting our goals, what are the time limits for providing QA/QC’ed data to modelers and other RaDyO participants, etc.
- 16:30 Walter Munk talk (title TBD).
- 17:30 Icebreaker reception.

Thursday, 7 June

- 08:30 Breakfast (on your own or provided is TBD)
- 09:00 Continue discussion on time schedule for Pier Test.
- 10:00 Wrap-up Scripps Pier Test Experiment.
Ensure that everyone is clear with the experiment plan and is aware of their marching orders.

Ken M. will figure out the pier key issue and trailer budget issue.

- 10:30 Coffee Break
- 10:45 Begin discussions for Benign Conditions field experiment.
Overview of what has been discussed so far- Summer/fall 2008 in the Santa Barbara Channel. Review ship use (R/P FLIP and R/V Kilo Moana) including personnel.
- Presentation of climatologies of the Santa Barbara Channel.
(1) Currents and hydrography: Tommy

Concerns about surface slicks and internal waves/solitons (Hemantha). Howard might want to sample slicks.

- 11:15 (2) Wave fields and meteorology: Ken M.
- 11:40 (3) Optics and potential for surface slicks: Grace

12:00 Lunch (on your own or provided is TBD).

13:00 Group discussion on the ideal location, dates, and duration of the Benign Conditions field experiment. Get consensus on exact dates and location.

Ideal location at Station #4, PnB.

Timing: 2 weeks of sampling time in September 2008.

FLIP departs SD morning of August 27, arrives onsite and moors August 28, booms out on the 29th, 4 days of set-up time, sampling starts September 3, last day of sampling the 17th, breakdown the 18th, booms down the 19th, flip on the 20th, leave for SD 21st, arrive SD the 22nd.

KM ship request for 2008: September 1 (loading), deploy mooring September 2 (set up time for everyone else), start sampling September 3, last day of sampling September 17, unload the 18th.

FLIP personnel:

Melville et al.: 2

Farmer et al.: 2

Banner et al.: 2

Stramski et al.: 2

Voss et al.: 1+

Dickey et al.: 1

KM personnel:

Farmer et al.: 3

Pegau and Wijesekera: 5

Twardowski et al.: 4

Lewis and McLean: 4

Banner et al.: 2

Voss et al.: 1

Stramski et al.: 1

Dickey et al.: 2

ROV with MASCOT and radiance camera (McLean research)

NURC (NOAA) 20-30 day deployment \$75-100K including operators

MBARI won't separate ROV from Western Flyer

FLIP

Variables Measured	Location of Sampling	Sampling	Point person
Directional wave field Bubble size distribution Fixed depth CTD (~1 m) Turbulence (coh Dop) Void fraction sensor Video camera (w/ light source – interference?) Thermistor string (~25 m) ADCP (300 kHz)	Sonars on hull Suspended between booms On deck between booms On starboard side from boat davit On hull	Multiple rates, all operating 24/7 (continuous)	Svein or David (1 rack, 3 days dock prep time)
2x Scanning Lidar 2.4 GHz comms IR, Video camera, laser altimeter w/ pan, tilt Momentum & heat flux w/ sonic Licor, rel hum, T, P, motion package, pyranometer, pyregeometer 2 Video cameras 2 Polarized cameras (sky and water) + motion package Stereo camera (water)	Face Boom (15x15m) Mast Face Boom O(few m) Face Boom 1 on boom, 1 on mast (large scale) Face Boom (1x1 m) Face Boom (1x1 m) * If not moored then, review use of booms because of wake issue	75 Hz, 18 hr/day 10-100 Hz, Intervals all day Variable, 24/7, 20 min sampling interval 20 Hz, Intervals all day 60 Hz, Sporadic during daylight 60 Hz, Sporadic during daylight hours	Russel Chris Chris (1 rack, ½ day on dock) Johannes Howard Howard
IR Video/active, laser, motion package, CO ₂ laser 2x Scanning Lidar MET mast with momentum and heat Light source w/ motion pkg 4 Hydrophones 2 Dopbeams Video camera ADCP (waves)	Port Boom O(m) Port Boom (10x10 m) Port Boom, two heights Port Boom Suspended from Port Boom Mast Hull	20 min/hr, 24/7 20 min/hr, 24/7 Continuous, 24/7 Sporadic at night Sporadic day and night 20 min/hr, 24/7 Continuous, 24/7	Luc or Ken M. (1 rack, ½ day on dock)
Directional wave spectra (WAMOS)	Mast	Continuous, 24/7	Linwood
Underwater radiance and irradiance Sky irradiance and total irradiance in air	Suspended from Face Boom (to 20-30 m, occasionally down to 100 m) On mast?	500-1000 Hz, 5-10 min during daylight hours Continuous, daylight hours	Dariusz (3' rack, ½ day on dock)
Polarized radiance distribution (in water and in air)	Suspended from Face boom and on tethered ROV	Episodic, every 2 min during daylight hours	Ken V. (3' rack space, ½ day on dock)

a_{pg} , b_p , c_{pg} (90- λ) (ac-s) a_g (9- λ) (ac-9) b_b (9- λ) CTD Chl (fl) NTU LISST-100	Vertical profiles from Starboard Boom	Once per hour, adaptive capability, to 200 m	OPL (3' rack, 1/2 day on dock)
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K/M

Variables Measured	Location of Sampling	Sampling Rate	Point person
ADCP METS CT Fl, NTU Sky radiance camera (Satlantic) CTD w/ bottles	K/M Mast Profiling	Continuously underway Continuously underway Continuously underway Continuously underway On station, daylight hrs Available	Tommy Marlon or Scott
CTD Bottle samples TSM HPLC POC Microscope ? $a_{pg}, b_p, c_{pg} (84-\lambda)$ (ac-s) $a_g, c_g (9-\lambda)$ (ac-9) $b_b (3-\lambda)$ VSF (3 angle) MASCOT (VSF, 10-170) LISST-100 Prototype optical sensors Radiance camera (Satlantic) Bubble resonator (???)	Profiling to 400 m Subsurface time series (TBD)	Daylight hours, hourly O(hrs)	Mike Marlon or Scott
Radiance camera c (660 nm) E_d & L_u (7- λ) CTD	Profiling (free fall)	Every 2 hrs, daylight hours	Marlon and Scott
$E_{d,s}$ & L_u (124- λ)	Profiling (free fall)	Every 2 hrs, daylight hours	Marlon and Scott
Upwelling radiance distribution (NURADS)	Tethered to avoid ship shadow	Daylight hours, whenever	Ken V.
Scanning LIDAR Video camera	On bow of K/M, O(15 m)	75 Hz, 24/7, continuous depending on data storage	Russel
Surfactants	Gizbox deployed from K/M, use small boat for ops?	Once per day, 4 hrs in water	Svein
$a_{pg}, b_p, c_{pg} (9-\lambda)$ (ac-9) b_b E_d (3: 7- λ , 489 & 532 nm) CTD Micro CTD C and Shear micro Motion package Radiance camera (Satlantic)	AUV launched with K/M crane and towed out with small boat ops (in motion)	8 Hz 8 Hz 8 Hz and 256 Hz 8 Hz 256 Hz 2048 Hz 256 Hz In water 8 hrs per day	Hemantha and Scott
ADCP (150 kHz) ADV (near-surface) $E_{d,s}$ & L_u (124- λ) $a_{pg}, b_p, c_{pg} (90-\lambda)$ (ac-s) CT	Moored upcurrent of FLIP		OPL

Chl (fl) CDOM (fl) Phycoerythrin (fl) NTU $b_b(3-\lambda)$ METS			
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14:00 Group discussion on data collection plans.
What instrumentation must be co-located in order to meet the goals of the RaDyO project? What measurements must be collected from R/P FLIP? Keep in mind that berthing is limited on FLIP. What supporting measurements can/will be collected nearby? How close is “nearby”? What sort of time synchronization methods will be used?

Time synch to GPS time.

(Coffee Break)

If group discussion goes smoothly, continue data collection discussion in detail. If necessary, break out into smaller groups. Recommend grouping together by instrumentation, i.e. co-location of, e.g., wave field camera with radiance camera or bubble package with MASCOT. There will of course be much overlap.

High Sea State Field Experiment (Before September 30, 2009):

August 15 – September 15, 2009, Hawaii – between Oahu and Kauai, 1200 m water depth

Climatology, winds and waves: Russel

Currents and hydrography: Tommy

Want reliable, 15 m/s winds and waves, clear water.

Point Conception (CA)

- Relatively turbid
- Spatially variable
- + Winds strong but variable
- Cloudy

Monterey Bay (CA)

****Hawaiian Channels (HI)**

- | | | |
|-------------------|-----|---------------------|
| HOT site | vs. | N. of Lanai |
| + Historical data | | +High winds |
| + Climatology | | - Refraction effect |
| +/- Long fetch | | +/- Highly variable |
| + High winds | | -/+ Short fetch |

Point Blanco (OR)

Gulf of Tehuantepec (S. Mexico) – Too much wind!

17:00 Recess for the day.

Table for pier test.

Friday, 8 June

08:30 Breakfast (on your own or provided is TBD)

- 09:00 If available, tour of the R/P FLIP. (Ken M.)
- 10:00 Recap Benign Conditions field experiment plans to identify gaps in the experiment in general or gaps in our sampling plan.
Any major issues should be resolved at this time.
- (Coffee Break)
- 11:45 Determine rough dates and location for High Sea State field experiment so that ship requests can be made.
- 12:00 Meeting adjourned.

T29 Cottage Above the Cliffs is not available in the afternoon. Any side meetings must be held elsewhere.