NAOJ, Mitaka, Tokyo, Japan, November 4-5, 2010

SKA-JAPAN WORKSHOP

Abstract Book

Participants List

Adami, Kristian Zarb	(Oxford)
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Aoki, Takahiro	(Waseda University)
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Bunton, John	(CSIRO)
Chibueze, James Okwe	(Kagoshima University)
Choi, Minho	(Korea Astronomy and Space Science Institute)
Dewdney, Peter	(SKA Program Development Office)
Diamond, Phil	(CSIRO Astronomy & Space Science)
Edwards, Philip	(CSIRO Astronomy & Space Science)
Fukue, Tsubasa	(NAOJ, Subaru)
Hanayama, Hidekazu	(NAOJ, Mizusawa VLBI Observatory)
Harada, Kenichi	(ELECS INDUSTORY CO., LTD.)
Harvey-Smith, Lisa	(CSIRO Astronomy & Space Science)
Hayashi, Takayuki	(The Univ. of Tokyo)
Hirabayashi, Hisashi	(ISAS/JAXA (retired))
Hirota, Tomoya	(NAOJ, Mizusawa VLBI Observatory)
Horrell, Jasper	(South African SKA Project Office)
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Iono, Daisuke	(NAOJ, Nobeyama)
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Suda, Hiroshi	(Fujitsu IBM)
Susa, Hajime	(Konan University)
Takahashi, Keitaro	(Nagoya University)
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Nov 01, 2010

Work Shop Program

11/4 (Thu)

Session 1:	SKA overview (Chair: Noriyuki Kawaguchi).
9:00--9:10	Opening Remarks (Hiroyuki Nakanishi).
9:10--9:50	Joseph Lazio (JPL) : The Science of the Square Kilometre Array.
9:50--10:30	Steve Rawlings (Oxford): Overview of the Square Kilometre Array.
10:30--11:00	coffee
Session 2:	SKA Pathfinder (1) (Chair: Joseph Lazio).
11:00--11:40	John Bunton (CSIRO): The Australian SKA Pathfinder: ASKAP.
11:40--12:20	Jasper Horrell (South African SKA Project Office): MeerKAT Overview: An Engineering and Technical Focus.
12:20--13:50	photo & lunch
Session 3:	SKA Pathfinder (2) (Chair: Peter Dewdney).
13:50--14:20	Masaya Kuniyoshi (MPI): Low Frequency Array.
14:20--14:50	Kristian Zarb Adami (Oxford): NlogN vs. N^2 Imaging Processes.
14:50--15:20	Minho Choi (KASI): Status of Korean Participation in the SKA Project.
15:20--15:50	coffee
Session 4:	Science (1) (Chair: Yoshiaki Sofue).
15:50--16:20	Ryohei Kawabe (NAOJ): Collaboration with ALMA.
16:20--16:50	Keitaro Takahashi (Nagoya): Origin and Evolution of Cosmic Magnetic Fields.
16:50--17:10	Takuya Akahori (Chungnam National University): Exploring Faraday Rotation Measure due to the Intergalactic Magnetic Field with the Square Kilometer Array.
17:10--17:30	Lisa Harvey-Smith (CSIRO): Studying magnetic fields using Faraday rotation of polarized extragalactic sources: Future prospects with ASKAP and the SKA.
17:30--17:40	break
17:40--18:10	discussion (1).
18:30--20:00	banquet

11/5 (Fri)

Session 5:	Technology toward SKA (Chair: Steve Rawlings).
9:00--9:30	Noriyuki Kawaguchi (NAOJ): Technical Interests on the SKA.
9:30--10:00	Peter Dewdney (SPDO): SKA update and engineering opportunities /ideas.
10:00--10:30	Philip Diamond (CSIRO): The potential socio-economic impact of the SKA
10:30--11:00	coffee
Session 6:	SKA Industry (Chair: Hiroyuki Nakanishi).
11:00--11:30	Toshiki Kumazawa (TOYO): SKA-Japan industry.
11:30--12:00	Carole Jackson (CSIRO): Engaging industry – the Australian SKA experience so far.
12:00--12:20	Tomoharu Kurayama (Kagoshima): Variable-Step Frequency Integration in the Decade/Century-Band Imaging.
12:20--13:50	lunch
12:45--13:15	4D2U
Session 7:	Science (2) (Chair: Philip Edwards).
13:50--14:20	Hiroshi Imai (Kagoshima): Astrometry from VERA to SKA.
14:20--14:50	Osamu Kameya (NAOJ): Pulsar study using the SKA.
14:50--15:20	Satoshi Yamamoto (Tokyo): Spectral line survey.
15:20--15:50	coffee
Session 8:	Science (3) (Chair: Ryohei Kawabe).
15:50--16:20	Tsutomu Takeuchi (Nagoya): Physics of the Formation and Evolution of Galaxies: Report from the High-z Working Group.
16:20--16:50	Motoki Kino (NAOJ): AGN science with SKA.
16:50--17:20	Kazuyuki Omukai (Kyoto): Probing the first star formation by 21-cm line.
17:20--17:50	discussion (2).
17:50--18:00	Concluding Remarks (Ryohei Kawabe)

Abstracts： Oral Presentations

The Science of the Square Kilometre Array.

Joseph Lazio (JPL)

Abstract: The Square Kilometre Array is intended to be the centimeter– and meter–wavelength telescope for the 21st Century. Its Key Science Programs address fundamental questions in astronomy, physics, and astrobiology---questions that have been highlighted in the recent European Astronet and U.S. Decadal Survey reviews. I summarize the SKA Key Science Programs, and discuss some of the synergies with other major facilities, notably ALMA.

Overview of the Square Kilometre Array.

Steve Rawlings (University of Oxford)

Abstract I will review the status of the SKA project focussing on the benefits of the phased approach to the project including progress in the Preparatory Phase (PrepSKA) and the pre–construction phase 2012–2016

The Australian SKA Pathfinder: ASKAP.

John Bunton (CSIRO)

Abstract: ASKAP is a radio telescope being built at the proposed Australian SKA site. It consists of 36 12m parabolic reflector with a 188 element phased array feed at the focus. Over it operating frequency range of 0.7 to 1.8GHz the phased array gives ASKAP a field of view which is 30 times larger than a dish with a single feed at the focus. The phased array feed will give ASKAP an observing speed that is more than an order of magnitude greater than any existing telescope.

The extra challenges posed by this telescope are the development of the novel chequerboard phase array and the high impedance differential LNAs, transporting the 188 signals from the phased array to downconverters and digitisers and then the beamforming of this data. To do this ASKAP has a compute capacity of ~2 Petaops/s and an optical network transporting ~100Tb/s. For the SKA the cost of the feed and beamformer system needs to be reduced substantially. This appears possible for the digital signal processing but advances are needed in the PAF, LNA, downconversion and analogue to digital conversion system.

MeerKAT Overview: An Engineering and Technical Focus

Jasper Horrell (South African SKA Project Office)

Abstrac: MeerKAT is an SKA Precursor radio telescope of 64 x 13.5 m dishes currently under development in South Africa and forms part of South Africa's SKA bid programme. MeerKAT is a fully-funded and aims, not only to develop and demonstrate SKA technology, but also to be the most sensitive Southern hemisphere cm wavelength radio telescope array in the period building up to the SKA. This talk provides a broad overview of the the project, highlighting engineering and technical aspects. Included are: the status of the project; the development of the radio quiet site; engineering, deployment and early results of the 7-dish (KAT-7) engineering and science testbed; industry involvement in the project; MeerKAT technology development and phasing; the MeerKAT array layout; and the approved MeerKAT major science programmes.

Low Frequency Array

Masaya Kuniyoshi (Max-Planck-Institut fur Radioastronomie)

Abstract: LOFAR is the LOw Frequency ARray at 10-240MHz (Phased array of ~10,000 dipole antennas) for radio astronomy, which has greater resolution and sensitivity than Very Large Array (VLA) and Giant Meterwave Radio Telescope (GMRT). LOFAR was built by ASTRON in the Netherlands. The project is expanding to other European countries, which are Germany, Great Britain, France and Sweden at the moment. The total effective collecting area is approximately 1 square kilometer. The key projects are the Epoch of Reionisation, Large-sky surveys, Transient radio phenomena and pulsars, Ultra-high-energy cosmic rays, Cosmic magnetism, and Solar physics and space weather. I belong to the transient radio phenomena and pulsar group, and the cosmic magnetism group. The pulsar group has already observed more than 100 pulsars and produced the pulsar profiles. I'll present some recent results and the future strategy.

NlogN vs. N^2 Imaging Processes

Kristian Zarb Adami （Oxford）

Abstract: In this work, I will present a summary of the beamforming techniques, both in the RF and in the digital domain used for aperture arrays in the SKA. In particular I will show results of the Two-Polarisation All-Digital (2-PAD) Aperture Array demonstrator designed and built in the UK as part of SKADS. Further to this, I will present new techniques including the Fast-Fourier Transform Telescope and the MOFF correlator which allow traditional imaging and calibration techniques to scale as NlogN rather than N^2 and show a direct comparison between N^2 and NlogN images formed by the Medicina BEST-2 cylindrical array. I will show how these techniques are being investigated on 2-PAD and on new science-capable demonstrators (specifically in the EoR and H1-precision cosmology regime) that will be built in the US as well as on one of the representative sites. I will end by summarising the roles, of cylindrical arrays, regular and sparse aperture arrays in the first phase of the SKA.

Status of Korean Participation in the SKA Project

Minho Choi （Korea Astronomy and Space Science Institute）

Abstract: I will summarize the status of radio astronomy projects in Korea, and will give a report on the status of various efforts in Korea in relation to the SKA.
I will also make brief comments on the SKA-related activities in Korea expected in the near future.

Collaboration with ALMA.

Ryohei Kawabe (NAOJ)

Abstract:

Origin and Evolution of Cosmic Magnetic Fields.

Keitaro Takahashi (Nagoya)

Abstract: There are many observations which indicate the presence of substantial magnetic fields in galaxies and even larger scales such as clusters of galaxies. However, the origin of such magnetic fields with large coherent length is still one of the greatest mysteries in astrophysics and cosmology. In this contribution, we report the activity of SKA-Japan "Cosmic Magnetic Fields" group toward understanding of origin and evolution of cosmic magnetic fields.

Proving Faraday Rotation Measure due to the Intergalactic Magnetic Field with the Square Kilometer Array

Takuya Akahori （Research Institute of Basic Science, Chungnam National University）

Abstrac: The nature and origin of the intergalactic magnetic field (IGMF) are an outstanding problem of cosmology, yet they are not well understood. The Square Kilometer Array (SKA) will explore Faraday rotation measure (RM) due to the IGMF in filaments of galaxies. In this talk, we report Theoretical investigations of the RM using a model of the IGMF motivated by the MHD turbulence dynamo simulations. For instance, for the present-day local universe, the probability distribution function (PDF) of |RM| follows the log- normal distribution, the root

mean square (rms) value for filaments is ~1 rad m^{-2}, and the power spectrum peaks at ~1 h^{-1} Mpc scale. By stacking simulation data up to redshift z=5 and taking account of the redshift distribution of radio sources, we found that the inducement of RM is a random walk process, so that the rms of RM increases with increasing path length. The rms value of RM for filaments reaches several rad m^{-2}. The PDF still follows the log-normal distribution, and the power spectrum of RM peaks at less than degree scale. Our results could be tested with SKA. We also mention the galactic foreground RM, and demonstrate how we can remove it, using a filtering technique.

The large-scale structure has a wide range of RM. On one hand low frequency observations would have an advantage for measuring Faraday rotation due to faind RM in filaments. On the other hand they would suffer from n pi ambiguity for strong RM in galaxy clusters. That is, high frequency observations are powerful tools. Therefore, for this subject, seamless and complementary observations with low and high frequencies, i.e. wide-band, re crucially important, and which could be achieved with contributions from Japan.

Studying magnetic fields using Faraday rotation of polarized extragalactic sources: Future prospects with ASKAP and the SKA.

Lisa Harvey-Smith （CSIRO Astronomy and Space Science）

Abstract: Faraday rotation is a powerful probe of magnetic fields in ionized volumes of the Galaxy, provided the number density of sources on the sky is sufficient to remove Faraday rotation due to the foreground and background. I will discuss a study of magnetic fields in discrete volumes of ionized gas in the local Galaxy using Faraday rotation of polarized extragalactic sources as a probe. With wide-field, sensitive surveys using ASKAP and the SKA, the power of this technique will extend to probing the structure of magnetic fields in many HII regions, supernova remnants and planetary nebulae in our Galaxy. It will be widely applicable to studying magnetic fields in galaxies, the halos of edge-on galaxies and galaxy clusters in the local universe.

Technical Interests on the SKA

Noriyuki Kawaguchi (National Astronomical Observatory)

Abstract: The SKA is attractive enough for many VLBI astronomers, especially from engineering points of view. It is a radio interferometer having outstanding sensitivity and resolution with a wide spaticial scale. I will present my personal view on possible technical contributions to the SKA.

SKA update and engineering opportunities /ideas.

Peter Dewdney (SKA Program Development Office)

Abstract:

The potential socio-economic impact of the SKA.

Philip Diamond (CSIRO)

Abstract: One of the factors taken into account by governments when deciding to invest in major scientific infrastructures is the potential socio-economic impact of the facility. This can range from the training of young scientists and engineers, through industrial contracts and spin-offs through to outreach to and education of the general public. I shall discuss how governments view the potential return on their investment, how it is measured and provide some examples of the socio-economic from radio astronomy and potentially from the SKA.

SKA-Japan Industry Forum

Toshiki Kumazawa (TOYO Corporation.)

Abstract: Introduction and activity of SKA Industry Japan. Propose the state-of-the-art direct sampling receiver.

Engaging industry – the Australian SKA experience so far

Carole Jackson (CSIRO Astronomy and Space Science)

Abstract: The development of technologies for the SKA CSIRO has actively engaged with industry, both as suppliers, R&D partners and also as a strong lobby for Australian SKA projects. In this short presentation, I'll present an overview of our strategies, successes and lessons learnt in this important area.

Variable-Step Frequency Integration in the Decade/Century-Band Imaging

Tomoharu Kurayama (Kagoshima University)

Abstract: In the synthesis imagings, source images are the Fourier transforms of visibilities, which is the observables on the uv plane. In the decade/century-band imaging, the loci on the uv plane is so wide. The values of u and v are the projected components of baseline vector divided by the observing wavelengths. In the case of decade/century-band observations, the u and v at the lowest frequency can be ten/hundred times as large as those at the highest frequency. We can no more integrate the frequency points simply.
However, frequency integrations are very important. In order to detect faint continuum sources, we need to integrate data in the frequency domain. Frequency integrations are important in the data reduction because they save the computer resources, such as hard disks and CPU time. We should integrate data in the frequency domain as much as possible. In this talk, I suggest a new method to integrate the data in the frequency domain with variable steps. In the imaging process, we normally carry out the gridding of
data in order to use the Fast Fourier Transform (FFT). FFT requires that the data must be assigned to a regular, rectangular matrix. Therefore the frequency integrations affect nothing if the integrated points spaced with the constant separations on the uv plane. We can achieve this situation with the frequency integration whose steps are not constant over frequencies. I report the concept of this method and some results of simple simulations.

Astrometry from VERA to SKA

Hiroshi Imai (Kagoshima University)

Abstract: Radio astrometry is now achieving microarcsecond-level accuracy. Using very long baseline interferometry (VLBI) technique, one can measure annual parallaxes of radio sources as far as 10 kpc from the Sun and proper motions of nearby galaxies as far as 1 Mpc. Even in milliarcsecond-accuracy achieved by connected arrays, episodic radio events have been identified. With higher sensitivity, a large area of astronomical themes, including e.g., extra-planet search, should be in scope of radio astrometry. Here we present current consideration of possible SKA astrometry in our science working group in SKA Japan Consortium. Some part of the consideration is based on our present astrometry with the VLBI Exploration of Radio Astrometry (VERA).

Pulsar study using the SKA

Osamu Kameya (National Astronomical Observatory)

Abstract: Pulsar is one of the important radio target sources of SKA. We can newly discover more than ten thousand pulsars which may cover the galactic plane. Collaboration with VLBI antennas in the world will produce many accurate trigonometric parallaxes together with proper motions of these pulsars. The results may realize density distribution of interstellar medium in our galaxy. Observations of shifts of pulsar timing may indicate exact evidence of propagation of gravitation wave.

Spectral line survey.

Satoshi Yamamoto (Tokyo)

Abstract:

Physics of the Formation and Evolution of Galaxies: Report from the High-z Working Group

Tsutomu Takeuchi (Nagoya)

Abstract: We report the recent discussion in the SKA Japan high-z working group. This time, we restricted our discussion to a frequency range of 1 – 15 GHz, which may be contributed from Japanese instrumentation group. Hence, we first discuss plausible scientific topics of H2O maser, NH3 lines, HI line, CO lines, and the continuum radiation. Then, we move on to a subject of 21-cm line cosmology, featuring the exploration of the non-Gaussianity of the initial matter distribution in the Universe.

AGN science with SKA

Motoki Kino (NAOJ)

Abstract: Active galactic nuclei (AGNs) is one of the key targets of SKA. In this talk, we will present an overview of our strategies for AGN science discussed in SKA-Japan AGN sub-WG. By utilizing the advantages of SKA's VLBI-order spatial resolution and micro-Jy order sensitivity, we will (i) explore open issues on jets which current VLBIs are not able to assess, and (ii) search for radio emissions from radio-quiet AGNs/galaxies.

Probing the first star formation by 21-cm line.

Kazuyuki Omukai (Kyoto)

Abstract: Theories predict that first stars in the universe were massive at about 100Msun and the dust grains produced in their supernovae induced the transition in characteristic stellar mass scale to lower mass. In this talk, I'll review how such star formation episode in the early universe imprinted the 21-cm signatures.

Abstracts： Poster Presentations

The ASKAP Survey Science Projects.

Philip Edwards (CSIRO):

Abstract:

Astrobiology and Circular Polarimetry of the Star-Forming Region using IRSF telescope in South Africa Astronomical Observatory.

Tsubasa Fukue (NAOJ):

Abstract: We report a image of circular polarization (CP) in the core of the Orion nebula, using IRSF 1.4m telescope at Sutherland, SAAO(South Africa Astronomical Observatory). Our results reveal that the CP extends over a region about 400 times the size of the solar system. If our solar system formed in a massive star-forming region and was irradiated by CP, then enantiomeric excesses could have been induced in the parent bodies of the meteorites. These would be subsequently delivered to Earth, and could then have played a role in the development of biological homochirality on Earth.

Generation Process of Seed Magnetic Fields with Biermann Mechanism in Primordial Supernova Remnants

Hidekazu Hanayama (NAOJ):

Abstract: Magnetic fields are ubiquitous in the Universe. However the origin is not still known. An amplification mechanism such as galactic dynamos is suggested to explain the observed strength of galactic magnetic fields. Although various origins have been proposed for seed fields amplified with the dynamos, there is no consensus. One of the generation processes of magnetic fields is the Biermann mechanism. The mechanism produces magnetic fields with a vorticity of plasma gas. The vorticity is generated in the region where the spatial gradients of the pressure and density are not parallel. The mechanism is expected to work in the bubble of the primordial supernova remnant. We perform a series of two-dimensional magnetohydrodynamic simulations with the Biermann

term and estimate the amplitude and total energy of the produced magnetic fields. We find that magnetic fields with amplitude $10^{-17}-10^{-18}$ G are generated inside the bubble after the relaxation of electron temperature in Sedov phase. This corresponds to magnetic fields of 10^{26} erg per each supernova remnant. Considering the primordial star formation rate, the spatially-averaged magnetic energy density is estimated as 10^{-42} erg cm^{-3}. The amplitude of magnetic fields in protogalaxies is expected as 10^{-19} G which is strong enough to be the seed magnetic field for galactic dynamo.

Multi-wavelength polarimetry of radio-loud broad absorption quasars

Takayuki Hayashi (Univ. of Tokyo):

Abstract: In some quasars, blue-shifted broad absorption lines (BALs) are observed and it is ascribed as the cause of outflow of accretion disk according to their extremely high velocity (~ 0.1c). There are hypothesis that this phenomenon are observed when quasars are young. To test this, we conducted multi-wavelength polarization observation for radio-loud broad absorption line (BAL) quasars at Jun 2010.

VLBI Observations of Galactic radio sources.

Tomoya Hirota (NAOJ):

Abstract: I will present results of our VLBI observations of radio continuum sources in nearby star-forming regions. In addition, I will propose high-resolution/high-sensitivity observations with VERA, JVN, EAVN, and future SKA of Galactic radio continuum sources.

The roadmap of LLFAST: The Lunar Low Frequency Astronomy Telescope, and its implication of collaborations with SKA

Takahiro Iwata (ISAS):

Abstract: The Lunar Low Frequency Astronomy Telescope (LLFAST) is a series of proposed space mission to achieve a large scale interferometry on the lunar far side to observe lower frequency. The first step is a Moon-Earth space VLBI proposed to SELENE-2. We will present the roadmap of LLFAST, and the implication of collaborations with SKA.

Antenna system for SKA.

Toshiki Kumazawa (TOYO Corporation):

Abstract: 12m Full motion antenna system from Patriot Antenna Systems /COBHAM.

Expectation for SKA as a powerful system for Jupiter's inner magnetosphere investigations.

Hiroaki Misawa and Fuminori Tsuchiya (Tohoku Univ.):

Abstract: Jupiter's synchrotron radiation (JSR) is generated by the relativistic electrons trapped in Jupiter's inner radiation belt (JRB). Variation of JSR is, therefore, an important probe to investigate generation and dissipation processes of the relativistic electrons. Recent JSR observations have revealed the existence of short-term variations at a time scale of several days to weeks inferring some global electro-magnetic activities in the JRB. Now more precise investigations are needed to clarify details of variation characteristics and their causalities. SKA is one of the most powerful radio instruments for the purposes. We will introduce present status and remaining problems in the JRB studies by JSR observations, and prospect of future observations with SKA.

Simultaneous observations of radio and X-ray pulses from the Crab pulsar: Kashima-Suzaku collaboration.

Kumiko Nagata (Tokyo Institute of Technology):

Abstract: The origin of giant radio pulses (GRPs) from the Crab pulsar is a long-standing enigma from the very discovery of this pulsar itself. A recent progress in the study of Crab GRPs is a discovery of a 3% correlation between radio and infra-red pulses. Since the current upper limit for the Xray-GRP correlation is ~7%, some 3%-level correlation has not been excluded. In this poster we will present a progress report from a newly-started collaboration project between the NICT radio team and the Suzaku Xray teams to lower the upper limit for the Xray-GRP correlation (and to identify it, if any).

HI-selected Galaxies As a Probe of Quasar Absorption Systems

Katsuya Okoshi (Tokyo University of Science)

Abstract: We investigate the properties of local HI-selected galaxies within the hierarchical structure formation scenario using semi-analytic galaxy formation models. The local HI-selected galaxies provide us with direct information about the amount of neutral gas and the gas distribution by radio surveys (e.g., blind radio surveys; HIPASS, ALFALFA). A population of quasar absorption systems, Damped Lyman-alpha (DLA) absorption systems, is a strong probe of physical and chemical conditions of galactic gas and intergalactic media because the majority of neutral hydrogen in the universe resides in DLAs rather than galaxies observed in optical/IR observations.

Here, by drawing a detailed comparison between the properties of the HI-rich galaxies detected by blind radio surveys and the HI absorption system, we investigate a link between the local galaxy population and the quasar absorption systems, paricularly for DLAs and sub-DLAs. First, we find that DLA galaxies where the HI column densities (N(HI)>10^{20.3} cm^{-2}) are as high as those of DLA systems, contribute primarily to the population of local HI galaxies at M(HI) > 10^8 M_sun detected in the radio observations. By contrast, in the low-mass range M_(HI) <10^8 M_sun, HI galaxies where the HI column densities (10^{20.3} > N(HI) > 10^19 cm^{-2}) are as high as those of sub-DLA systems, replace DLA galaxies as the dominant population. Second, we find that HI cross-sections/SFRs correlate tightly with HI masses at 10^6 < M(HI) < 10^11 M_sun. The galaxy population (M_(HI)<10^8 M_sun) selected homogeneously by both emission and absorption lines would place stringent constraints on key processes of galaxy formation and evolution. We will discuss a model-prediction for the SKA in this presentation.

銀河磁場とその起源

Yoshiaki Sofue (Meisei Univ.):

Abstract: 銀河および銀河系磁場について概括し、原初起源論について述べる。

Applications of the Next Generation A/D sampler ADS3000+ for VLBI2010.

Kazuhiro Takefuji (NiCT)

Abstract: In proposing VLBI2010, it is required four 1 GHz sub-bands sampling in 2 – 14 GHz radio frequency signal. A total data rate would become 16Gbps at maximum. In this requirement, we are developing a next-generation A/D sampler, which is called the ADS3000+. The ADS3000+ can sample analog signal up to 4 Gsps (GHz samples per second), 2 Gsps X 2 channels, 1 Gsps X 4 channels with 8 bits quantization. In addition, after digitized analog signal, signal-processing such as real-time DBBC (Digital Base Band Conversion) or simple suppressing RFI signals (CW) is possible with FPGA techniques. The ADS3000+ connected with VSI system (VLBI Standard Interface), is possible to control by telnet, transfer to the network with versatile Linux PC. Already first fringe at 4 Gsps mode has been successfully obtained in early 2009. As for Time and Frequency Transfer(TFT), we have a plan to observe Giant Pulse (GP) from the Crab pulsar with the ADS3000+. In the poster, We will report recent results and future observation plan with the ADS3000+.

Simulation of wideband feed.

Hideki Ujihara (NICT):

Abstract: ダブルリッジドホーン、TSA の COMSOL による数値シュミレーション

Title: TBD

Kenichi Harada (ELECS INDUSTORY CO., LTD.)

Abstract: