



NEW WORK ITEM PROPOSAL	
Date of presentation 2008-xx-xx	Reference number (to be given by secretariat)
Proposer ANSI	ISO/TC 211 /SC            N xxxx
Secretariat NSF	

A proposal for a new work item (including proposals for amendment or revision of an existing standard) **within the scope of an existing technical committee or subcommittee** shall be submitted to the secretariat of that technical committee or subcommittee with a copy to the Central Secretariat and, in the case of a sub-committee, a copy to the secretariat of the parent technical committee. The proposal will be circulated to the P-members of the technical committee or subcommittee for voting, and to the O-members for information. The proposer may be a member body of ISO, the secretariat itself, another technical committee or subcommittee, an organization in liaison, the Technical Management Board or one of the advisory groups, or the Secretary-General. Guidelines for proposing and justifying a new work item are given in the ISO/IEC Directives (part 1, annex Q) (see extract overleaf).

**The proposal** (to be completed by the proposer)

<p><b>Title of proposal</b> (in the case of an amendment or revision, or a new part, of an existing standard, show the standard number)</p> <p>Geographic information - Imagery sensor models for geopositioning</p>
<p><b>Scope</b> (as defined in 6.2.1 of part 3 of the ISO/IEC Directives)</p> <p>This Technical Specification will identify the information required to determine the relationship between the position of a remotely sensed pixel in image coordinates and its geolocation. It will support exploitation of remote sensing observations into interpreted geographic information. It will define the metadata to be distributed with the observation data to enable user determination of geolocations from the observations.</p> <p>This Technical Specification will specify several ways in which information in support of geolocation may be provided.</p> <ol style="list-style-type: none"><li>1. The information may be provided as a sensor description and the associated physical and geometric information necessary to rigorously construct a Physical Sensor Model. For the case where precise geolocation information is needed, this Technical Specification will identify the mathematical formulae for rigorously constructing Physical Sensor Models that relate two-dimensional image space (represented by pixel line / sample) to three-dimensional ground space (X, Y, Z or longitude, latitude and elevation) and support the rigorous calculation of propagated errors (e.g. covariance matrices and/or circular error / linear error) associated with the ground space locations. This Technical Specification will provide detailed information for three types of passive electro-optical / infrared (IR) sensors - frame, pushbroom and whiskbroom - and for an active microwave sensing system: Synthetic Aperture Radar (SAR). It will provide a framework by which these sensor models can be extended to other sensor types.</li><li>2. The information may be provided as a True Replacement Model, using functions whose coefficients are based on a Physical Sensor Model so that they perform in essentially the same way as the Physical Sensor Model they replace.</li><li>3. It may be provided as a Correspondence Model that provides a functional fitting based on observed relationships between the geolocations of a set of ground control points and their image coordinates.</li><li>4. It may be provided as a set of Ground Control Points that can be used to develop a Correspondence Model or to refine a Physical Sensor Model or True Replacement Model.</li></ol> <p>This Technical Specification will not specify either how users derive geolocation data or the format or content of the data the users generate.</p>

**Purpose and justification** (attach a separate page as annex, if necessary)

The purpose of this Technical Specification is to generate a generic sensor model that includes the case where rigorously constructed physical sensor models are needed. A set of components from which sensor models can be constructed for other sensors is provided. The intent is to standardize sensor descriptions and specify the minimum metadata requirements, by sensor type, for geopositioning imagery systems.

Vast amounts of data from imaging systems are collected, processed and distributed by government mapping and remote sensing agencies and commercial data vendors. In order for this data to be useful in geopositioning, further processing of the data is needed. Because of the diversity of sensor types and the lack of a common standard, data from different producers may contain different parametric information, lack parameters required to describe the sensor that produces the data, or lack ancillary information necessary for geolocating and analyzing the data. Consequently, a separate software package often has to be developed to deal with data from each individual sensor or data producer. Developing standard sensor models allows agencies or vendors to develop generalized software products that are applicable to data from multiple data producers and/or from multiple sensors. With such a standard, different producers can organize their data in the same way, thus promoting interoperability of data between application systems and facilitating data exchange.

This Technical Specification is based on the result of several years of development by a number of groups engaged in remote sensing and photogrammetry. Earlier drafts have undergone two cycles of public national review as drafts of ISO 19130, followed by consideration of the resulting comments by editing committees and revision based upon the editing committee actions. The draft has undergone further extensive revision since ISO 19130 was deleted from the TC211 programme of work when it outlasted its time limits

**Target date** (indicate the date by which the availability of the International Standard is considered to be necessary) 2009-06

**Relevant documents to be considered**

ISO 19111 Geographic Information - Spatial referencing by coordinates

ISO 19115-2, Geographic information - Metadata - Part 2: Extensions for imagery and gridded data

ISO TC211 211n1017, Draft review summary from project 19124, Geographic information - Imagery and gridded data components, December 1, 2000.

ISO TC211 211n1869, New Work Item Proposal for ISO/TS 19129 Geographic information - Imagery, gridded and coverage data framework, July 14, 2005.

DIN (Deutsches Institut für Normung):

DIN 18716-1: Photogrammetrie und Fernerkundung, Teil 1: Grundbegriffe und besondere Begriffe der photogrammetrischen Auswertung (terms of photogrammetric data capture)

DIN 18716-2: Photogrammetrie und Fernerkundung, Teil 2: Besondere Begriffe der photogrammetrischen Auswertung (special terms of photogrammetric data capture)

DIN 18716-3: Photogrammetrie und Fernerkundung, Teil 3: Begriffe der Fernerkundung (terms of remote sensing)

Open Geospatial Consortium Inc. Transducer Markup Language Implementation Specification, Version 1.0.0, OGC® 06-010r6, December 22, 2006.

Open Geospatial Consortium Inc. Sensor Model Language (SensorML) Implementation Specification, Version 1.0, OGC® 07-000, February 27, 2007.

Community Sensor Model (CSM) Technical Requirements Document, Version 3.0, December 15, 2005.

North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG), Air Reconnaissance Primary Imagery Data Standard, Base document STANAG 7023 Edition 3, June 29, 2005.

National Geospatial-Intelligence Agency. National Imagery Transmission Format Version 2.1 For The National Imagery Transmission Format Standard, MIL-STD-2500C, May 1, 2006.

**Relationship of project to activities of other international bodies**

The IEEE Geoscience and Remote Sensing Society (IEEE GRSS) is a category A liaison of ISO/TC 211. The IEEE-GRSS, through Data Archiving and Distribution Technical Committee (DAD TC), of which the proposed project leader is the chair, is working on the interoperability of remote sensing systems and data. It is expected that IEEE GRSS will provide major inputs to this proposed project.

The International Society for Photogrammetry and Remote Sensing (ISPRS) is working on issues of the interoperability of photogrammetric and remote sensing systems and data. ISPRS is a category A liaison of ISO/TC 211. The proposed project leader and editor are actively participating in ISPRS activities. It is expected that ISPRS will be a major contributor to this proposed project.

The Committee on Earth Observation Satellites (CEOS) is an international organization that promotes international cooperation on satellite Earth observations. The Working Group on Information Systems and Services (WGISS) is responsible for promoting data interoperability and standards among the space agencies. CEOS/WGISS is a category A liaison of ISO/TC 211. Leaders of this proposed project are also involved in CEOS WGISS activities.

The Open GIS Consortium (OGC) is a category A liaison of ISO/TC 211. The OGC working groups on Earth Imagery and on Coverage Geometry and Functions worked on topics similar to this proposed project. OGC members participated in the ISO/TC 211 19130 project and editing committees that produced the draft that is part of the proposed NWIP. Many members of the ISO/TC 211 19130 project were also members of the OGC technical committee and working groups. OGC participation in this proposed project is expected to continue.

The Digital Geographic Information Working Group (DGIWG) has developed standards for the exchange of imagery data, including sensor parameters related to that data, together with ISO/IEC JTC 1/SC 24. DGIWG is a category A liaison of ISO/TC 211.

**Liaison organizations**

ISPRS, CEOS, OGC, DGIWG, CSMWG, NTB,  
NATO JISR CG, IEEE GRSS

**Need for coordination within ISO and IEC**

ISO/JTC 1/SC 24

**Preparatory work**

A draft is attached

An outline is attached and it will be possible to supply a draft by (date)

Proposed project leader (name and address):

**Project leader:**

Dr. Liping Di

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U. S. A.

**Editor:**

Dr. Wolfgang Kresse

**Concerns known patented items**  
(see part 2 of the ISO/IEC Directives)

yes  no

If YES, provide full information as annex

Signature of the proposer

As the responsible member body we confirm that the requirements in Annex Q of Part 1 of the ISO/IEC Directives on the *Justification of proposals for the establishment of standards* have been met by this proposal.

Date of circulation

Closing date for voting

Signature of the TC or SC secretary

## Comments and recommendations of the TC or SC secretariat

### Comments with respect to the proposal in general, and recommendation thereon

(Indicate any issues to be brought to the notice of committee members. For instance, refer to any associated vote on form 5 regarding adoption of any attached draft for direct progression to DIS.)

## Elements to be clarified when proposing a new work item (new standard)

### Title

Indicate the subject matter of the proposed new standard.

### Scope

Give a clear indication of the coverage of the proposed new work item and, if necessary for clarity, exclusions.

### Purpose and justification

Give details based on a critical study of the following elements wherever practicable.

- a) The specific aims and reason for the standardization activity, with particular emphasis on the aspects of standardization to be covered, the problems it is expected to solve or the difficulties it is intended to overcome.
- b) The main interests that might benefit from or be affected by the activity, such as industry, consumers, trade, governments, distributors.
- c) Feasibility of the activity: Are there factors that could hinder the successful establishment or general application of the standard?
- d) Timeliness of the standard to be produced: Is the technology reasonably stabilized? If not, how much time is likely to be available before advances in technology may render the proposed standard outdated? Is the proposed standard required as a basis for the future development of the technology in question?
- e) Urgency of the activity, considering the needs of other fields or organizations. Indicate target date and, when a series of standards is proposed, suggest priorities.
- f) The benefits to be gained by the implementation of the proposed standard; alternatively, the loss or disadvantage(s) if no standard is established within a reasonable time. Data such as product volume or value of trade should be included and quantified.
- g) If the standardization activity is, or is likely to be, the subject of regulations or to require the harmonization of existing regulations, this should be indicated.

If a series of new work items is proposed, the purpose and the justification of which is common, a common proposal may be drafted including all elements to be clarified and enumerating the titles and scopes of each individual item.

### Relevant documents

List any known relevant documents (such as standards and regulations), regardless of their source. When the proposer considers that an existing well-established document may be acceptable as a standard (with or without amendments) indicate this with appropriate justification and attach a copy to the proposal.

### Cooperation and liaison

List relevant organizations or bodies with which cooperation and liaison should exist.

### Preparatory work

Indicate whether the proposer or the proposer's organization is prepared to undertake the preparatory work required for the new work item.